

Tell Me a (Data) Story:

Data Graphics in Higher Education and Nonprofit Communications

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Table of Contents

About the Author.....	2
Executive Summary.....	3
Introduction.....	4
Literature Review.....	7
Research Question.....	24
Method.....	25
Interview Findings & Discussion	27
Informal Content Analysis of Data Graphics.....	34
Limitations and Future Research.....	44
Strategic Communications Recommendations.....	46
References.....	50
<i>Appendices</i>	
Appendix I: Interview Questions.....	54
Appendix II: Interview Transcripts.....	55
Appendix III: Figures Included.....	79

ABOUT THE AUTHOR

Laura Fyfe is the Communications Manager at the Pre-Health Student Resource Center at the University of Minnesota, where she has worked for over 10 years. She has a love of graphic design, and an appreciation for the power of visual communications. Working in higher education for more than a decade, she has seen the important role that data plays in showing organizational impact, while also seeing how hard it can be to balance resources in order to turn that data into an engaging, effective story. This combination of interests led her to undertake this research project to learn more about how other organizations are using and sharing their data through visual communications.

Laura would like to thank the following:

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EXECUTIVE SUMMARY

This paper explores the role that data graphics play within the communications strategy at higher education institutions and nonprofit organizations. The specific research questions focus on whether these two types of organizations are using data graphics in their communications, as well as identifying any barriers that organizations have in creating and integrating data graphics into their communications.

A literature review examined work that provided a foundation for the research, including looking at the difference outcomes of evidence vs. narrative messaging, the rise in data and information graphics in communications, the storytelling power of data, and the ability of data to communicate complex concepts. While no research was found that directly spoke to how higher education institutions and nonprofits use data graphics within their communication strategy, this research looked more broadly at current topics around communications and data analytics within these fields.

Additionally, communications leaders at Twin Cities higher education institutions and nonprofits were interviewed to learn about the current state of their communication strategy, if they were using data graphics to help achieve communications and organizational goals, and the barriers they may face in doing so. An informal content analysis was conducted to review examples of data graphics used the two chosen fields.

Looking at these pieces in summary, this research then offers strategic communications recommendations for organizations who want to adapt with the growth in the field of data visualization, and use data to help them tell engaging and impactful stories that help them further their strategic goals.

INTRODUCTION

In today's world, data is all around us. It is generated, collected, analyzed, and, when possible, communicated to necessary audiences. When communicated well, data can lead people to meaningful insights that would not have been realized without seeing the quantitative information shared in such a way. In 2012, Jonathan Harris, a scholar, artist, and data scientist, told a CreativeMornings crowd in New York City that “good data design has to begin with a secret, or an insight, that you can deliver to people and that can only be revealed through the design of that data in a particular way.” There is great potential in sharing information in a way that leads the audience to clear insights.

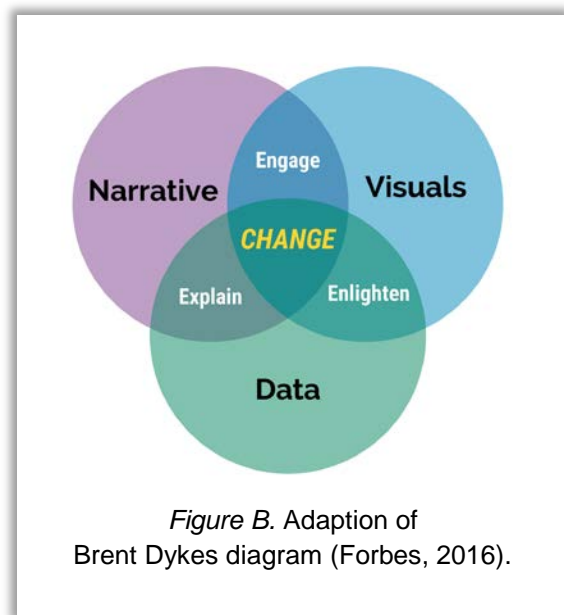
In this recently released example (see Figure A), the World Bank Group is sharing nearly 90 pages of charts, graphs, and various other data visualizations in an “Atlas of Sustainable Development Goals”, a “visual guide to key trends and the issues that surround them” (World Bank Group, 2018, p.iii). This booklet tells the stories of the World Development Indicators, and the authors state the booklet, “aims to help us better understand progress on the SDGs and to aid policy makers engaging with them in their everyday work” (p. iii). This is one clear example of an organization sharing key data points and communication messages in a visual manner, with the goal of greater understanding for a broader audience.



Figure A. Cover of World Bank Organization's Atlas of Sustainable Development Goals (2018)

Within individual organizations, communications professionals are in a prime position to help translate insights — from the bytes of data being collected, to their audiences — in order to help achieve communications goals. This is not to say that communications professionals need to be trained as data scientists; there are hopefully other members of the organization’s team that can partner with the communications team to share the task of analyzing the data. However, communicators can play an important role in sharing the story behind the numbers with an audience. As Steven Few said in *Show Me The Numbers* (2012), “Important stories live in the numbers that measure what’s going on in the world. Before we present quantitative information, we must first uncover and understand its stories. Once we know the stories, we can tell them in ways that help others to understand them as well” (p. 295).

In 2010, Segel and Heer recognized that there was an “emerging class of visualization [that] attempts to combine narratives with interactive graphics” (p. 1137). Vande Moere and Purchase (2011) found that “visualization is turning into a medium in its own right — a popular medium ... which has the freedom to be artistic and seek an emotional response” (p. 357). This trend has only continued over the decade since, with great potential for organizations to tell stories supported by the data that speaks to their audience. In a recent Forbes article (2016), data storyteller Brent Dykes outlines a case for the power of storytelling with data. He



describes how data, visuals, and narrative — when combined — can strengthen each other more than when used separately. According to Dykes, “when you combine the right visuals and narrative with the right data, you have a data story that can influence and drive change” (p. 1), as shown in Figure B. The ability to drive change, or make an impact, is one for which organizations strive. The desired result of this “change” will look different for different organizations, whether it is support for a cause, or money raised; however, in most cases organizations are communicating with a goal in mind.

This research will look specifically at the fields of higher education institutions and nonprofit organizations in regard to the role that data graphics can play as part of their communications strategy. Higher education institutions and nonprofit organizations, while different, have key similarities that lend them to be looked at together within the context of this research. Higher education institutions and nonprofit organizations are similar in that much of what they offer are services, not products in the traditional sense. They are often both mission-driven, and are trying to reach people who will support and champion their mission. Both types of organizations, but especially nonprofits, are almost constantly soliciting money from their various audiences. The two types of organization often face similar barriers when it comes to investing into communications. Due to these characteristics and constraints, it is vital that both types of organizations are communicating in the most effective way possible to achieve their desired results that further their organizational goals.

LITERATURE REVIEW

Evidence (Statistical) vs. Narrative Messaging

There is a fair amount of conflicting research in terms of what type of messaging is more persuasive, evidence (statistical) based or narrative based, across different fields of communication. This paper reviews three industries where research has been conducted comparing the two message formats: health communication, political communication, and donor-focused marketing psychology research.

Health Communication

The field of health communication has a large base of research into these two communication types. Examining this industry specifically, Zebregs, van den Putte, Neijens, & de Graaf (2015), conducted a meta-analysis of 15 studies that “included a condition with only statistical as well as a condition with only narrative evidence” (p. 284), which allowed them to compare both types of evidence within the same study. They used the following definitions when discussing the two types of evidence. With support from Allen & Preiss (1997), Zebregs, et al. (2015) stated that “statistical evidence summarizes quantitative information on a large number of cases and can be generalized across a population” (p. 282). Building on a foundation of Kopfman, Smith, Ah Yun, and Hodges (1998), Zebregs, et. al (2015) articulates that narrative evidence “presents a cohesive story that describes a setting and episode, often from the perspective of one or more protagonists and often involving information about goals, plans, actions, and outcomes” (p. 283).

Zebregs, et al. (2015) wanted to provide deeper insights into the differences between the effects of narrative and statistical evidence, and focused on three variables

commonly found in research on persuasion: beliefs, attitude, and intention. For this background, they relied on the previous works by Ajzen & Fishbein (1980, 2008) on the Expectancy-Value Theory. Zebregs, et. al (2015) found that statistical evidence had more of an influence on beliefs and attitudes, while narrative evidence had more of an influence on intention. They concluded that within the field of health communication, it is important to consider what the intended goal is, for example changing beliefs vs. producing more tangible outcomes, and to match the type of communication messaging to a specific goal.

In a more recent article, health communication researchers narrowed this lens even further by looking specifically at whether narrative vs. non-narrative (evidence based) health messages are more effective in a public health emergency situation (Bekalu, Bigman, McCloud, Lin, & Viswanath, 2018). They found that “non-narrative message format may be more effective than its narrative counterpart to communicate basic prevention information during public health emergencies” (p. 287). Specifically, “compared with the narrative and/or fictional version [of the message], the more didactic and factual format was found to be more effective in changing knowledge and perceived response efficacy related to prevention of pandemic influenza” (p. 287). These findings give some weight to the idea that when information needs to be quickly and clearly understood to produce a specific outcome in a short timeframe, using statistics and evidence-based communications can have better results than narrative messaging.

Political Science Messaging

In a new article in the field of political science messaging, Nyhan and Reifler (2018), scrutinized the role that the graphic presentation of data can play when trying to

alter misconceptions. They considered two factors in their results, the first being how much information a person previously had on the specific topic, and the second being the person's previously held view on the topic. Nyhan and Reifler conducted three experiments "concerning issues for which some citizens may be unwilling to acknowledge factual information that contradicts their preexisting beliefs" (p. 2). These experiments tested if charts and graphs, containing data related to the issues, did a better job of correcting misconceptions than text-based statements. Their results found that "providing participants with graphical information significantly decreases false and unsupported factual beliefs" (p.20). They frustratingly admitted that this is not always the case, and there are cases that even when presented with accurate, factual information — no matter how it is presented — a person's views on the topic will not change. They found enough evidence though, to demonstrate the benefits of using charts and graphics, which show patterns of information and add context to the information being conveyed. While this research has a slightly different lens than a straight evidence vs. narrative comparison, it helps examine if there is unique value in including visual representations of data in a targeted message.

Marketing Psychology

Looking at the question of evidence vs. narrative message types from yet another industry, marketing psychology researchers examined which type of message format would increase the probability that someone would monetarily donate to a cause. Small, Loewenstein, and Slovic (2007) conducted an experiment where they gave two different communication pieces to two experimental groups, one piece offering statistics about child hunger in Africa, the other telling a story about an individual child that is

threatened by starvation. At the beginning of the experiment, each person was given five one-dollar bills. After each group was exposed to the communication piece, they were offered the chance to donate that money to the cause, Save the Children. In this experiment, the narrative story proved more powerful, as people donated an average of \$2.83, compared to the average of \$1.17 that people donated after reading the statistical communication piece. In this context, the data alone did not have as strong an impact as the personal story. This conclusion aligns with what Zebregs, et al (2015) had later found in regards to narrative messaging having a higher impact on intention, which in this case turned into behavior. On the other hand, it conflicts somewhat with what Bekalu, et al. (2018) and Nyhan and Reifler (2018) found, in that their results showed that non-narrative communications was more effective and efficient at communicating their messages and achieving the intended impact.

This researcher believes that the communications landscape has changed greatly since Small, et al. conducted their research in 2007. During an interview in 2009, Hal Varian, who was then, and still is, serving as Google's Chief Economist, predicted that "The ability to take data — to be able to understand it, to process it, to extract value from it, to visualize it, to communicate it — that's going to be a hugely important skill in the next decades" (McKinsey, 2009). He saw that data was becoming a prominent part of people's everyday visual stimuli, and that larger scale audiences were being exposed to data and analytics at a higher rate in their everyday media intake. As people become more exposed to, and more comfortable with, seeing and interpreting data graphics, this may affect how persuasive data graphics are in furthering a specific communications goal. The present research will only address this from the internal organizational

strategy perspective; however, further research exploring the public's perception related to data graphics and visualizations and their persuasiveness in communications is recommended.

Increase in Data Graphics & Visualization

As found across a host of research, data visualization and other forms of information graphics have become more common across a variety of media types (de Haan, Kruikemeier, Lecheler, & van der Nat, 2017; Dunlap & Lowenthal, 2016; Krum, 2013; Segel & Heer, 2010; Vande Moere & Purchase, 2011). There is sometimes confusion between the terms data visualization and infographics, so this research relies on Krum's (2013) definitions. Krum (2013) defines data visualization as the "visual representations of numerical values" (p. 2). Information graphics, or infographics are "a larger graphic design that combines data visualizations, illustrations, text, and images together into a format that tells a complete story" (p. 6). Though these terms are sometimes used interchangeably, there is a difference, in that an infographic does not necessarily include the "visual representation of numerical values." Infographics can be used to represent a complex workflow, for example, which may not include data points, but may help simplify a complicated process to allow for easier understanding. Infographics may, and often do, include data, however it is not a set component of the medium. Two examples from the same organization are included here, to provide an example of each type, with Figure C showing a form of data visualization, and Figure D showing an infographic. The infographic shown in Figure D does include two data graphics within the six content boxes, along with other boxes that merely contain graphic icons that relate to the content. The present research will focus on data

visualizations, from simple statistics and graphs to larger interactive data visualization

dashboards. It may also examine infographics, if the infographics include data within their display.

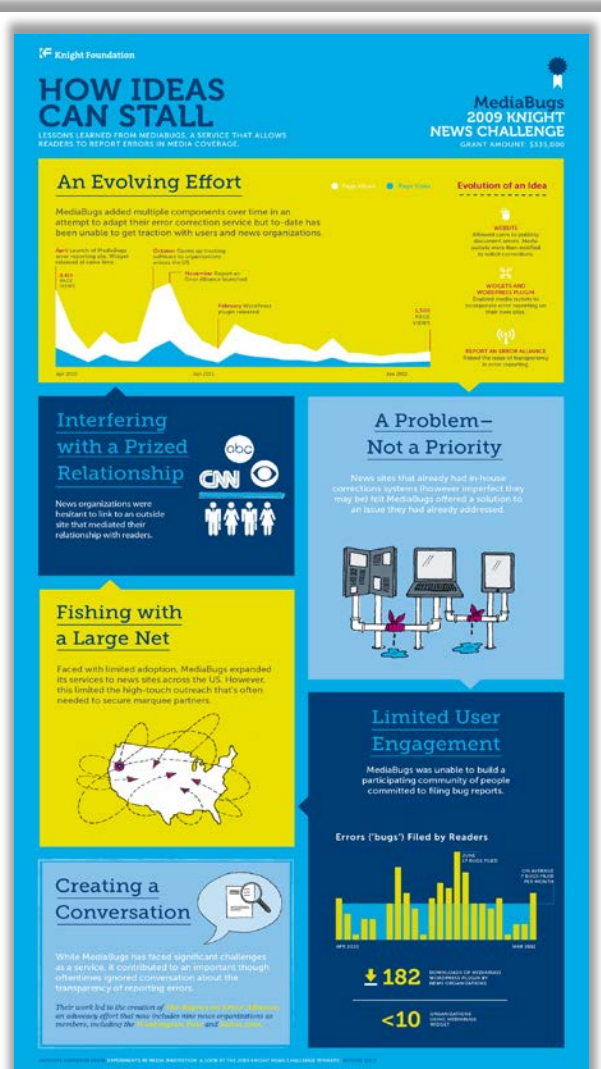


Figure D. Knight Foundation (2012) Infographic

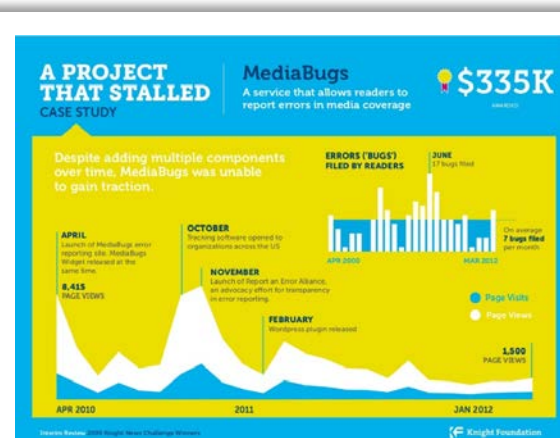


Figure C. Knight Foundation (2012)
Data Visualization

We have moved into an information age where data is being collected at every opportunity, at times more data than organizations even know what to do with. In 2016, analysts from Forrester Research estimated that 60-73% of data being

collected by organizations was not being used for any strategic action (Gualtieri, 2016). When interviewing experts for this research, one of the questions posed was “What data is important to your organization?” It is important to understand, for each organization, what is the underlying data that, when shared effectively, will help it further its mission

and meet its goals. In the World Bank Group's Atlas of Sustainable Development Goals (2018), the forward states:

“Data are critical for decision making and accountability. While analysis of big data is commonplace in the private sector, similar techniques can be adopted by development professionals to gain real-time insights into people's well-being and to better target aid interventions for vulnerable groups.” (p. iii)

This statement aligns with the researcher's perspective that the union of data analysis and communication should be happening at all types of organizations, including higher education institutions and nonprofits. There is great potential today for time and resources to be wasted collecting and reviewing data that does not move the needle for the organization. Bringing communications professionals into the conversation can help understand the data that best helps drive the mission of the organization, and help focus resources.

According to a report from IBM and partners in 2017, certain job skills related to data saw significant growth in 2016; 40% growth for “data science,” 38% for “quantitative data analysis,” and 31% for “data visualization,” with a projection of the number of data professional positions in the US to reach 2.7 million by 2020 (Markow, Bragnaza, Taska, Miller, & Hughes, 2017, p. 3). While the numbers found by IBM do not list communications specific positions, they support the fact that data skills are a growing demand, and with that comes the need for professionals to communicate the data insights. When examining the role of design within information visualization, Vande Moere and Purchase (2011) discuss how while information visualization has been a part of computer science research for some time, the medium is evolving. They explain that

“in recent years ... both the increasing prevalence of software development skills and the increasing public accessibility of data sources has had a significant effect on information visualization practice” (p. 356). They go on to state that “the typical user audience of information visualizations has increased from a limited number of highly skilled and experienced data experts to the large, lay masses” (p. 356). As data plays a larger role in people’s lives as individuals and as organizations, it is important that there are enough people learning how to analyze large data sets, and then, even more importantly, translate their insights to a broader audience of people.

Enhancing Stories with Data

While the narrative form of communication is still powerful, this research aims to examine the ways that including data within the story, specifically using a graphic representation, can strengthen an organization’s ability to further their communication and strategic goals.

As data visualizations have become more mainstream within various types of media, particularly journalism (de Haan, et al., 2017), communications professionals have begun to examine and appreciate the storytelling power that data visualizations can have (de Haan, et al., 2017; Lankow, Ritchie, & Crooks, 2012; Segel & Heer, 2010). Researchers are beginning to consider the advantages of using data visualizations within communications; a few examples of which will be discussed below.

Vande Moore and Purchase (2011) looked at the role the design plays in information visualization, and found that pleasing aesthetics can be “useful in supporting utility” (p. 363) of the visualization. They stated that “highly aesthetic representations may compel the user to engage with the data, enabling more effective communication of

the information itself”

(p. 363). The layered

colors in Figure E

(World Bank Group,

2018) help make it

visually appealing,

while also helping the

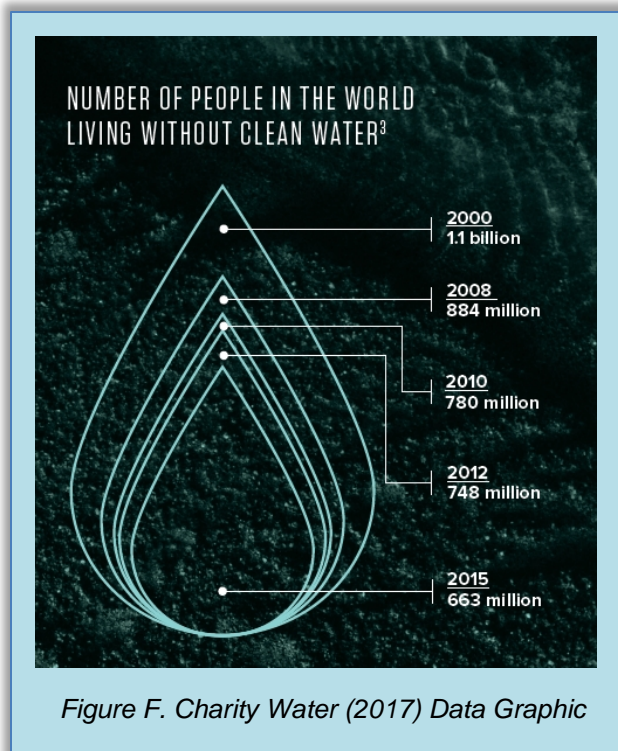
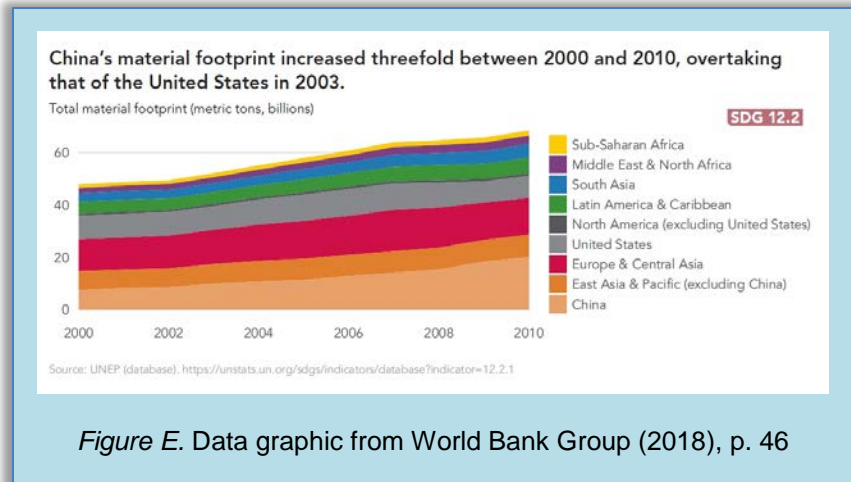
reader clearly see the

size of each country or region’s impact. Looking at Figure F, the organization could

have easily made a bar chart showing reduction in the number of people living without

clean water (Charity Water, 2017). However, due to their organization’s mission and

identity, they instead created an attractive water droplet graphic representing the



decrease in size. This aligns closely with

the visual brand of the organization, and

helps connect the numbers to the overall

issue. Stephen Few (2012) said that

“The right numbers have important

stories to tell. They rely on us to find

those stories, understand them, and then

tell them to others in a way that is clear,

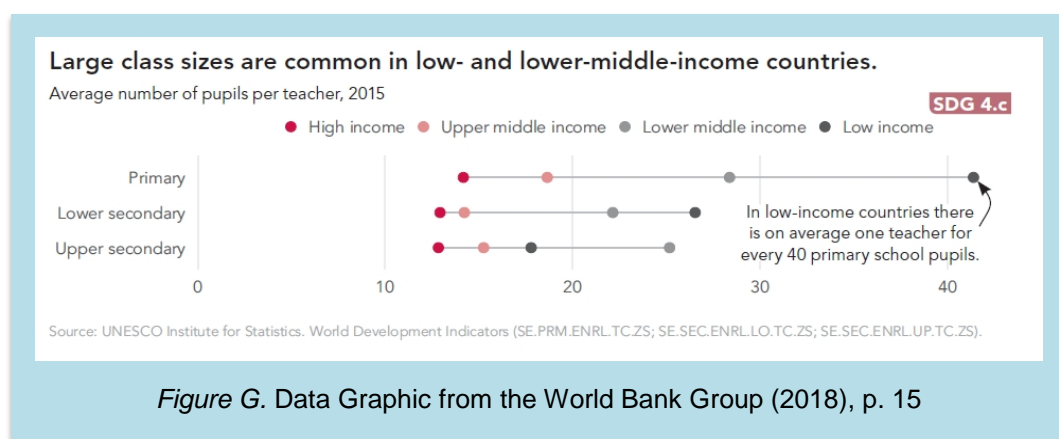
accurate, and compelling” (p. 9). The

communications team within an

organization needs to work closely with

whichever team member is working with the organization's data, to collaboratively decide how to put that compelling voice behind the data, and share it with key audiences. The concepts discussed above articulate how it is not enough to merely have and share data, but that organizations need to consider the aesthetic appeal of, and the story behind, the data in order to have it be most effective in furthering the communication goals of the organization.

Another benefit that data visualization can have for an organization's communications is the ability to help audience members understand complex topics (Dunlap & Lowenthal, 2016; de Haan, et al., 2017; Cukier, 2010; Yi, Kang, Stasko, & Jacko, 2008). The work of Dunlap and Lowenthal (2016) highlighted the power of the visual image, stating "the more visual an instructional or information message is, the more likely it is to be recognized and recalled" (p. 44). Pettersson agreed, writing in 2010 that "visuals can strengthen language fluency by enhancing memory and recall, as well as providing a visual schema in which information can be organized and studied" (p. 180). The example shown in Figure G from the World Bank Group (2018) gives



readers a chance to clearly and very quickly see the difference in class sizes across different income levels, and the extreme outlier that exists with low-income, primary

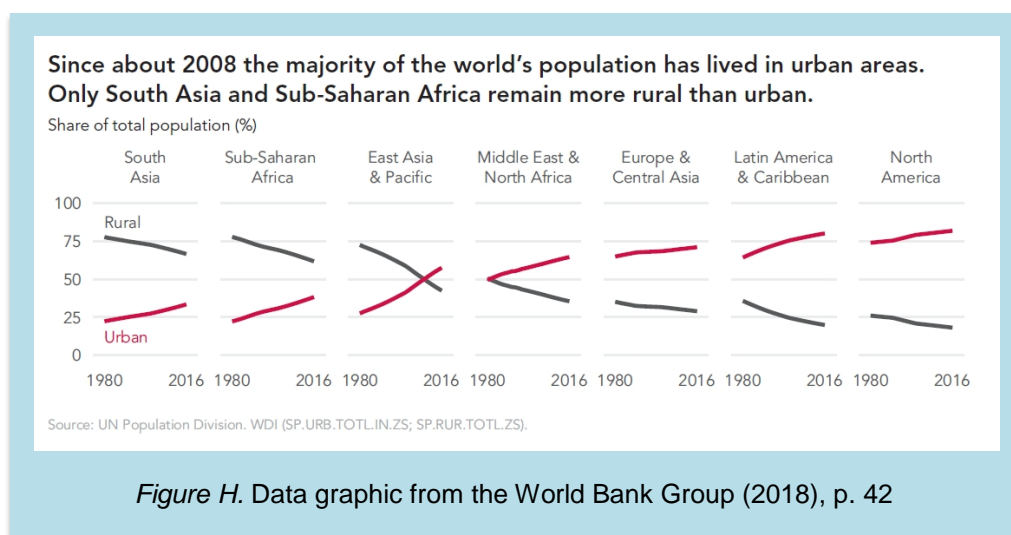
school classes. Lankow, et al. (2012) added that “presenting information by way of engaging visuals immediately attracts readers and entices them to dig deeper into the content” (p. 40). These findings describe the advantages that visual displays of data can have for an organization. Visual displays of data can engage the audience with the information, give them a way to organize and make sense of it, and then excite them to want to learn more.

In their research into how people gain insights using information visualization, Yi, et al. (2008), found that one benefit of information visualization is that:

“a visual representation of data can decrease the gap between the data and the user’s mental model of it, thereby reducing cognitive load in understanding, amplifying human recognition of familiar presences, and linking the presented visual information with real-world knowledge” (p. 4).

In another example from the World Bank Group (2018), Figure H provides a clear and simple opportunity for readers to see the rate of the increases and decreases and

where there is large disparity between the two lines, without focusing in on the exact numbers



themselves. Berinato (2016) puts this idea even more simply: “what we actually do

when we make a good chart is get at some truth and move people to feel it - to see what couldn't be seen before" (p.100). Berinato (2016) goes on to include that the role of a good chart can be, "to change minds. To cause action" (p. 100). This simple statement encompasses the power that visualizing data can have, when done well.

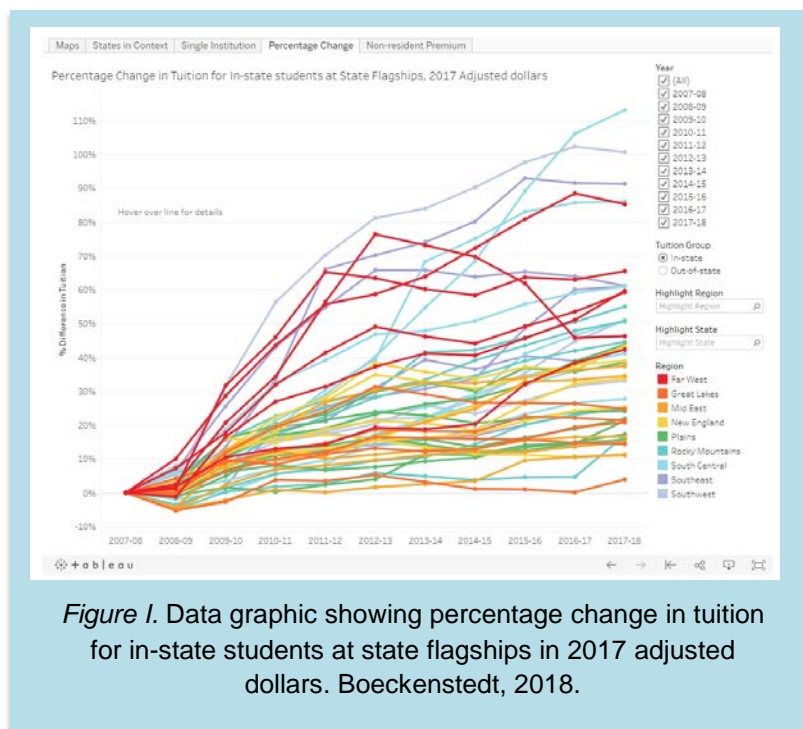
Higher Education and Nonprofit Communications Literature

After an extensive search, this research was unable to find any academic, peer-reviewed research that looked at higher education and nonprofit organizations using data graphics or data visualization in their communication strategy. This section will look at the non-academic sources that were reviewed as part of the literature review on the topic of higher education and nonprofit communications.

Higher Education Institutions

One interesting find was a blog titled Higher Ed Data Stories, authored by an Associate Vice President for Enrollment Management at a large, private university. In his "What This Blog is

About" section, he says "I've long believed data can make stories richer and can provide more insight into the things we live out each day. And I think the stories I can tell that most need telling are about Higher Education in the United States"



(Boeckenstedt, n.d.). For the past 5 years, Boeckenstedt has been taking publicly available data, inputting into the data visualization software Tableau, and telling insightful stories that include data visualizations and contextual explanations. Figure 1 shows a data graphic that displays the percentage change in tuition dollars for in-state students, showing clearly just how much in-state tuition has grown over the last 10 years. Boeckenstedt's blog shows a sampling of what kinds of trends and insights can be shown through data visualization.

While not specifically about showing and communicating data, a 2017 article on Inside Higher Education spoke about the changes that are occurring within higher education communications and public relations. The authors, Melichar and Brennan, make a case that communications at higher education institutions is moving to a much more strategic approach than the role it played in the past, one that "intentionally aligns communications offices to serve the highest needs of their institutions" (2017). This change isn't happening without some "growing pains", as the article calls them – one specifically tied to organizational leaders or long time communications professionals being resistant to bringing a more strategic outlook to communications. When sharing some quotes that higher education professionals shared with the authors, one person stated,

"My boss reports directly to the president, and in the 25 years he's been here we've never had a strategic plan for the communication office. And he won't let me create one. He spends his time writing the president's speeches and statements, and pays little attention to the rest of our work." (p. 1)

Another person shared the following with Melichar and Brennan,

“My college doesn’t have a clear vision, nor a strategic plan. Without those, it’s awfully hard for me to know where to focus my team’s energy. We’re forced into being a ‘brochure factory.’ Right now there are 148 active projects in our six-person shop—and I’m sure that two-thirds of them will have little to no impact. Yet I find it hard to get out from under the blizzard of demands and do the work I know will really help my school move forward.”

Melichar and Brennan (2017) go on to say that if higher education institutions are not able to adapt to the changes happening in the communications profession in other fields, such as using a more strategic approach and utilizing analytics, they are in danger of losing talented professionals to a more adaptable markets.

As the rise of ‘big data’ is occurring in our society, the field of higher education has had to explore the opportunities and challenges it has when facing this issue. The Chronicle of Higher Education produced a special report in 2017 titled, “The Digital Campus: Big Data”, which covered topics such as data security, using data to look at student success, and how big data alone is not enough without context and insights. The 2016 National Survey of eLearning and Information Technology in US Higher Education found that only 24% of survey participants — Chief Information Officers and senior campus IT officials at 339 two- and four-year colleges and universities across the U.S. — felt that their recent campus investments in analytics were “very effective” (The Campus Computing Project, 2016). Kenneth Green, founding director of the Campus Computing Network who administers the survey, was not surprised to see this. He goes on to explain this by saying,

“The effective use of analytics involves more than deploying a new technology.

While good analytic tools are, of course, important, so too is user training.

Campus officials and faculty who are eager for just-in-time, complex analyses of student performance really do need effective training with these new resources to understand both the potential and also the limits of the data and these analytic tools.” (The Campus Computing Project, 2016)

One specific area that did appear in the literature was how higher education institutions are using data to look at student success. The University of Iowa is doing something unique with student learning analytics, in that they have created Elements of Success, a student portal which “provides real-time performance feedback for students, helping them to monitor their performance and understand what they need to do to succeed” (University of Iowa, n.d.). The creators report that “many students report not knowing how they are doing and that estimates of their final grade may be unrealistically high or low” (University of Iowa, n.d.). Going on to discuss why they use data visualizations rather than other methods, they continue by stating, “By arming them with data about how they are doing, students are able to make informed decisions about their learning behavior” (University of Iowa, n.d.). In researching the impact of their Elements of Success tool, they found that “students who regularly checked EoS achieved significantly higher scores on subsequent exams and better final grades than did students who did not check” (University of Iowa, 2018). This example of higher education utilizing data visualizations to communicate highlights an internal audience — the students. It demonstrates, with evidence, how using data to communicate brought the audience to insights that many were not achieving without seeing the visualizations.

Nonprofit Organizations

Again, noting that this research was unable to uncover any literature on the topic of data graphics' impact on nonprofit communications, this research considered a few examples of how the idea of communicating data is being seen at nonprofit organizations. Going back to 2012, a visual communications professional wrote a blog post titled, "Infographics and Data Visualization: Not Your Grandmother's Pie Chart" on the Nonprofit Marketing Guide blog site. Reich, the author, highlighted a Minneapolis nonprofit who was using more infographics and data graphics in their annual reports recently. The nonprofit creative director told Reich that "using infographics throughout the annual report — a page in each section, including donors, clients and volunteers — was part of a strategic decision to provide more transparency and clarity" (Reich, 2012).

Looking more recently at the 2018 Minnesota Council of Nonprofits Communications and Technology Conference, there were two sessions that would help communications professionals at nonprofit organizations gain an understanding and skills around communicating with data (MN Council of Nonprofits, 2018). One session, titled "Big Data: Creating Better Organizational Intelligence", wrote in their description summary,

"Technology has made more information accessible to anyone, but how do you translate the data and communicate it with your constituents. Our panel will discuss different vehicles for collecting and communicating big data, how to interpret the data and how to use the data to further your mission." (MN Council of Nonprofits, 2018).

Another session, “Data Analysis for Showing Program Impact”, told conference attendees the following about their session,

“Communicating your program’s impact is a key tool for acquiring funding, attracting donors and recruiting volunteers. Without impact data, your communications strategy can feel hollow to donors and volunteers. This session will provide practical, easily applied knowledge for conducting data analysis to show program impact and change.” (MN Council of Nonprofits, 2018).

Both of these sessions show an awareness within the field of nonprofit communications that communicating with data can be an impactful tool in a professionals’ communications toolbox.

CONCLUSION

After an extensive search, no literature was found that examined the role that data graphics plays in the communications for higher education institutions and nonprofit organizations. In order to build a framework with which to proceed in this previously uncovered direction, the researcher conducted a review of related literature in order to build a foundation for this research. To begin, this work considers literature that compares the outcomes of evidence (statistical) based messaging versus narrative messaging. It then moves into examining the rise in data graphics in communications, followed by the storytelling qualities of using data within a narrative. It closes by reviewing current developments within higher education and nonprofit communications and their use of data analytics, in and outside of the communications realm.

There is a great potential for communicators to play a key role in translating the insights from data into meaningful connections. In today’s information age, where data

is being collected and analyzed by organizations, and viewed by the general public on a daily basis, it is vital to have professionals who know how to blend the data into the story an organization is trying to tell. As Few (2012) puts it, “as presenters of quantitative information, it is our responsibility to do more than sift through the information and pass it on; we must help our readers gain the insight contained therein” (p. 9). What better role for communications professionals to play than to step in and help translate those insights, with their understanding of organizations’ key audiences, and a firm grasp on the strategic and communications goals of their business. Communicators have an opportunity to influence the way organizations are sharing important data with their key stakeholder audiences. Due to the very limited research into how data graphics fit into and benefit organizational communications, this research aims to fill this gap in the literature. This research strives to understand how comfortable organizations are, specifically higher education institutions and nonprofits, with collecting, analyzing, and then especially communicating data to their audience in a graphic display, as well as to learn about the barriers they see in being able to do so.

Research Question

This research will examine higher education institutions’ and nonprofit organizations’ communications, specifically where and how data is used and with what purpose. This paper examines three specific research questions:

1. Are organizations using data visually within their communications?
2. If so, where, how, and what are their goals in doing so?
3. If not, why not? Do they not see the value, or are there barriers that are holding them back?

METHOD

This research was primarily conducted using in-depth interviews with communication experts. Details of this method and the participants are described below. In addition to the in-person interviews, a informal content analysis of data graphics from higher education institutions and nonprofits is included for review in the findings section below.

EXPERT INTERVIEWS

Participants

This research project utilized in-depth interviews with Communications Directors, or a similarly placed role within the organization, representing eight different organizations in the Minneapolis-St. Paul metro area from both the higher education and nonprofit industries. The titles of the interviewees ranged from Communications Manager to VP of Marketing and Communications, with the eight different individuals holding seven varying titles. The purpose of these interviews was to understand the role that data graphics play within each organizations' communication strategy, and to identify common barriers to presenting data in a graphic form. Originally, 13 communications professionals were contacted with an invitation to participate in an interview; in the end, eight consented to participate. The interviews represented five higher education institutions and three nonprofit organizations. The higher education institutions consisted of accredited, four-year colleges and universities. The group of communications experts was made up of five women and three men.

Procedure

Before completing interviews with experts, the researcher met with three other communications professionals to pre-test the interview questions and help ensure that the questions were going to lead to the types of insights the research was hoping to produce. The interviews were then conducted between May 30 and June 27, 2018. All interviews took place in person. The interviews consisted of 11 questions, and each interview took between 35 - 70 minutes. The interviews took place most often in the workplace of the communications professional, though occasionally in a common space, such as a coffee shop. The interview consisted of 11 structured questions (see Appendix 1). There were times in which the answer for one question was already addressed as the interviewee was answering a different question, so at times the researcher asked fewer than 11 questions to an individual. The interview questions focused on the research themes mentioned previously:

1. Are organizations using data visually within their communications?
2. If so, where, and how?
3. If not, why not? Do they not see the value, or are there barriers that are holding them back?

The interview transcripts (see Appendix 2) have been stripped of any identifying information, in order to provide a degree of anonymity to the interviewees. This was done to allow the interviewees to speak openly about the communication strategy within their organization, their use of data and data graphics, and the barriers they might face in doing so. This anonymity was important to a few of the interviewees, so although it, at

times, precludes specific details being included in the interview transcripts, it was important to value on behalf of the participants.

INTERVIEW FINDINGS & DISCUSSION

When reviewing the interview findings, several key themes emerged. Early in the interviews, this included themes regarding the role of the communications leader or team, and how they worked with organizational leadership when setting the communications strategy. As the interviews progressed, themes regarding data graphics became more of the focus. In addition, this research was interested in the barriers that organizations may face when interested in using data graphics. These themes are outlined below. These findings help address the lack in research into the role that data graphics play within organizational communications for the higher education and nonprofit industries.

Communications strategy aligns with organizational goals

As a communications researcher would hope to find, almost all of the interview participants (seven of eight) shared that the leader of the communications team worked closely with the top organizational leadership to assure that the communications strategy aligns with the overall goals of the organization. One participant said, “I work with our leadership to ensure we’re matching the organization’s business goals with the communications messages that we develop.” At times, these sentiments were on a broader scale, and sometimes they were in reference to specific communications tactics, such as making sure the five rotating images on the organization’s homepage all lead to a story that matches one of the overall strategic priorities. One participant

encompassed this theme by stating that a goal of their communications team was to “try (their) best to use communications in support of the higher mission of the organization.”

When the communications team has access to and an understanding of important organizational data, they can use the insights from that data to help direct more strategic communications to further the organization's goals. One participant shared their experience by stating, “We gather data from every department. We can look at that data, and see where the gaps are in our programming meeting its goals. That helps us direct communications more strategically to fill the gaps.”

Data brings clarity

In discussing what is at the heart of this research, all eight participants shared, in a variety of ways, that they felt that data graphics can bring clarity to an issue in a unique and important way. As one participant stated, “When you put it into a picture, you get context.” A number of participants agreed that our culture is becoming more visual, and that it will be important for organizations' communications to adapt to this change. One participant shared their experience of presenting information to a group of stakeholders. When hearing just the verbal argument, the particular task seemed daunting and impossible. In response, the communications team created a data graphic to put the information into a larger context, and, “the [stakeholder group] reacted totally differently.” Similarly, another participant said, when changing a communication message from text form to a data graphic, “putting it in those terms made it somehow much easier to understand”. Yet another participant added that they have taken an important message they share annually and moved into a series of data graphics. They have found that “it's the best and most powerful way we can communicate the

information.” One participant made the analogy that by integrating important organizational data with a related story, “we’re trying to help connect the dots.” This is a simple explanation of one of the key goals of a communications team; helping the audience connect the dots between the work an organization does, and the impact it has. Interview participants stated they find data graphics — showing data and/or numbers in a visual way — to be a useful tool in achieving that goal.

A few participants had caveats to this, emphasizing specific points about sharing data visually. One participant said, “I think important data could be overlooked if we didn’t use graphics to help make it interesting.” This connects to the research from Vande Moore and Purchase (2011) that discussed the importance of the aesthetic qualities when visualizing data. Another participant felt strongly that “[the data] cannot stand alone – it has to have a story.” They stressed how important it is to build the story around the data, which provides context for the audience. As one participant said, “At the core, it’s storytelling.”

Multiple participants discussed financial and/or budget information as an area where they found data graphics and visual communication extremely helpful. Budgets can be large, messy spreadsheets, and even if an organization is transparent with their financial information, that may not mean that it is being clearly communicated to an important audience. One participant was speaking about one of their decision making audiences, and said at times when people see money in a chart format, they feel overwhelmed and confused. However, if you can put that information into an infographic that helps tell the story connected to the financials, it will help the audience understand.

As another participant stated, “Visuals help you take a complicated amount of stuff, and communicate it quickly in an easy way, to make it easier to understand.”

Organizations use data with stakeholders

Across both types of organizations, a common audience for data graphics was when they were communicating to key stakeholders. Sometimes this was part of a budget summary or funding request, and other times through channels such as an annual report — five of eight organizations expressed that they use data graphics within their annual report, often connected to their budget summary. One organization shared a story about how they were making changes in the development of this coming year’s annual report as it relates to data. In previous years, their report had narrative stories in one section, and program data in a separate section. For this coming year, they intend to integrate relevant data onto the same page as a story, in the form of well-designed data graphics.

One participant said, when asked about the audience they would be most likely to use data graphics with, said “The higher-ups. When we are talking with them, and especially requesting funding, we need to have the numbers available, accurate, and easy to understand.” Another participant said “we use [a new visual communications tool that includes data graphics] in our funding request presentation. We used to bring handouts [with spreadsheets], and now we show a video with lots of data graphics.”

Another shared that their communications team partners closely with their finance team to prepare messages, saying “We work with our finance department to help showcase the financial stability of our organization. There is a lot of graphics used in that work.” Lastly, another participant said that their stakeholder group was very comfortable with

data, which makes the use of data graphic a smart tactic. They said, “We share a lot [of data graphics] with our influencer group, who is very numbers focused. They are actively involved business people who are spending their day using data to make decisions.”

Data lends credibility to your organization

A majority of the interview participants (five of eight) expressed that they felt that including data in their communications helps bring credibility and legitimacy to their organizations. One participant shared their perspective that “American culture loves a proof point.” The organizations included in the research sample, higher education institutions and non-profits, are reliant on a variety of funding streams with a variety of expectations. These organizations are all under great pressure to measure, and communicate, their outcomes and successes. As one participant said, “I think organizations love showing data, love showing a proof point, showing their outcomes.” When an organization has data that demonstrates those points, they need to communicate it clearly to key audiences. Based on feedback from the interview participants, there is agreement that an engaging data visual will be the most powerful and effective way to achieve this.

A few participants discussed that they felt that infographics and other data graphics, since becoming used more often across many types of media, are being seen as more legitimate communication pieces. One participant in particular thought there was a generational difference in how infographics specifically are perceived. In their experience, they find that a Baby Boomer audience does not identify with infographics, whereas their Gen Z audience sees them as a “legitimate source of data”.

BARRIERS

This research was also interested in examining what barriers organizations found in producing engaging data graphics. Two key themes emerged from the interviews.

Resources across the board

Just over half of the participants that were interviewed (five of eight) explicitly indicated that they were lacking in resources — either financial or in staff expertise — to be able to successfully produce data graphics as a standard part of their communications portfolio. One participant shared that they only have resources for a part-time graphic designer, and that person's time was already pressed creating standard visual branding materials for the organization. A participant said that their barrier was “resources at a high level - financial, cost for staffing, etc.”, where another mentioned that they do not even have anyone on their staff to produce graphic communications, and it only gets produced when they contract with an outside firm with design capabilities. “In a nutshell,” one said, “we have such a small staff, we move around so quickly on mission critical things, that the visual data piece tends to fall to the bottom of the list.” Another participant felt similarly, expressing that they felt that their small team was always strapped for time, and might be able to produce a few data visuals here and there, when they felt really important to the story the organization was trying to tell.

Lack of understanding the why and how of data graphics

A few of the participants expressed that even if their organization had more financial resources and more staffing, that it wouldn't be enough if there wasn't a clear understanding of why integrating data graphics into communications can be valuable, and what the best practices are in doing so. One participant shared that "at an organizational level, we're lacking an understanding of what role data stories and visual data could play. We understand that data is important, and that stories are important, but not how to bring them together." Another participant agreed that organizations need the expertise on how to analyze the data, but "also to think about data in terms of what story you're trying to tell." These results show the importance of the communications team working in partnership with the data experts at the organization, to bring together the best minds when looking at what data is available, and what story is the organization hoping to tell.

Hesitant to share

One additional theme that came out of the interviews was a hesitancy to share data, which came with a variety of reasons for it. One participant worried about the data being interpreted accurately; they said, "Like telling any story, any story is open to interpretation." They went on to discuss how people may or may not have the skills to tell the difference between valid data and less valid data, asking about if people saw the results of a study, would they know the difference in meaning if the sample size was 13 versus 13,000.

Concerns about privacy came out as another reason an organization may not be comfortable sharing certain types of data. One of the higher education institutions said

that in order to provide some transparency around student financial aid, “we could put together profiles of ten students and what they pay vs. what they get in financial aid, but people don’t want to share their financial information.” Another participant shared, “For legal and ethical reasons we are protective of the privacy of the people we serve. The data stories might help us talk about the big idea, tell the story, without pinpointing a specific person.”

Interview Summary

The results of these qualitative interviews brought clarity to two important findings that directly address the stated research questions. When asked, “is your organization using data graphics,” seven of the eight (86%) of the participants in the sample said yes. The interviews yielded even stronger result when asking participants, “do you see value your organization using data graphics,” in that all eight participants (100%) agreed that yes, they see value in sharing important data in an engaging, visual way. By working closely with organizational leadership, communications leaders can assure that communication goals are in alignment with and working to strengthen high level organizational goals; and results of this research show that visualizing data can be a tool that is used to achieve this.

INFORMAL CONTENT ANALYSIS OF DATA GRAPHICS

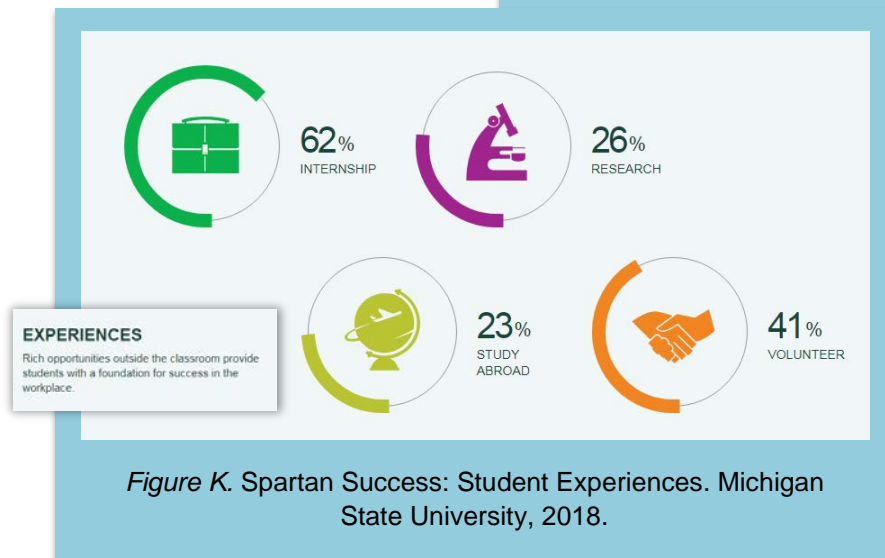
Due to the anonymous nature of the interviews, this research chose not to analyze the data graphics used in communication pieces from the same sample of organizations that participated in the interviews. Instead, it reviewed examples from similar organizations on a national level from both higher education institutions and

nonprofit organizations. The following section will showcase these examples, providing a short summary and assessment about each one.

Higher Education Institutions

Michigan State University

These first three examples are from Michigan State University, on a webpage that is highlighting “Spartan Success” (Michigan State University, 2018). This webpage was found as a link off of their main Admissions webpage, with the key intended audience of prospective students and their parents. The entire Spartan Success webpage consisted of 4 topics: career placement, location



of graduates, salaries, and collegiate experiences. The data shown was collected as part of the 2017 Destination Survey Report, a survey of post-graduation outcomes of

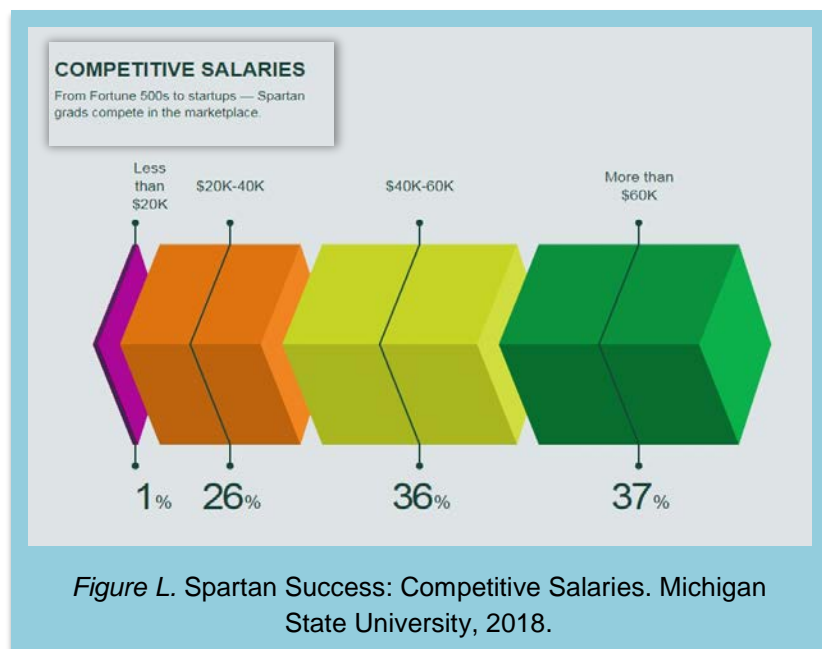
spring & summer 2016 bachelor's degree recipients, administered by MSU Career Services Network (Michigan State University, 2018).

Figure J displays career placement statistics for graduating MSU students, showing that 95% of graduates were either working, in graduate school, or both, within 6 months of graduation. This data appeared gradually as the mouse scrolled down the page, with the figures darkening around the circle, one row at a time, until 95 of the 100 figures were shaded in.

Figure K highlights MSU student experiences, using donut charts. It shows how many students participated in four categories of experiences: internships, research, study abroad, and volunteering.

In addition to the circle graphs, these graphics include icons that visually communicate the various experience categories. The solid colored outline of the circle filled in as the mouse was scrolled down the webpage.

Figure L is titled 'Competitive Salaries', and breaks down the starting salaries that MSU graduates have in the employment marketplace. These colorful shapes expanded out from the left side as the mouse scrolled into this section.



This Spartan Success webpage shows an example of a higher education institution sharing important data points in a colorful, graphic way, instead of just listing the statistics in text form. Michigan State University considered their primary audience, prospective students and their parents, and highlighted 4 data points that they knew would be most important to them. When considering choices for higher education, knowing what kind of financial investment this can be, parents are quite often concerned with their child's employment prospects after graduation. This Spartan Success page is designed to be easy and appealing to look at, using bold colors and motion graphics, with the communications goal of giving parents a piece of mind that their student will almost certainly be employed (or on their way to further education) and making a livable wage upon graduation. This webpage is a successful version of simple data visualization that furthers an important communication message.

Higher Education Summary Data Reports

During this scan of higher education institutions outside of the Twin Cities, a common form of communicating data was found at a number of colleges and universities. This was in the form of a long data summary report, called a variety of names, for example: Data Digest (University of Wisconsin – Madison & University of Iowa) and The Michigan Almanac (University of Michigan), and Stanford Facts (Stanford University). These publications are 147, 107, 194, and 62 pages long, respectively. Most of these types of publications have very basic tables and graphs that are not given much graphic treatment. These long PDF data summaries were often difficult to find on the universities' websites. They seem to have a fairly limited audience, as they were not highlighted on their websites' main landing pages. This communication format is not

easily attained, or digested, by most public audiences. It is not the most dynamic way for a University to share a whole host of interesting, important data points.

Included here are four examples, Figures M thru P, a sample from each publication mentioned above, that are displaying the same data point — the racial/ethnic breakdown of their student body. Of the four examples included here, only the example from Stanford included data graphics that took the data beyond a simple table, bar, or pie chart. Stanford's publication included multiple pages in the same vein as this example, including bright colors and other graphic icons and symbols along with the visual representations of data.

University of Wisconsin - Madison 2017 - 2018 Data Digest | Students | 6

Fall Semester Headcount Enrollment by Racial/Ethnic Category (Federal Methodology)

Student Level	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Undergraduate	29,153	28,690	28,897	28,737	29,118	29,504	29,392	29,580	29,536	29,931
Domestic	1,048	1,103	1,131	1,247	1,288	1,354	1,403	1,406	1,455	1,559
Hispanic (All Races)	705	762	685	644	611	633	620	616	628	631
African American (Only)	147	128	109	79	67	65	65	62	52	59
American Indian (Only)	1,574	1,575	1,566	1,540	1,590	1,626	1,609	1,635	1,710	1,793
Native Hawaiian (Only)	15	22	25	30	39	36	37	38	32	31
White (Only)	23,152	22,519	22,631	22,468	22,595	22,757	22,578	22,541	22,140	21,903
2 or More Races (Non-Hispanic)	224	347	466	603	719	777	809	873	968	982
Unknown	893	901	811	412	225	118	88	80	81	239
International	1,335	1,433	1,673	1,714	1,984	2,138	2,093	2,329	2,460	2,734
Summary	2,616	2,750	2,731	2,834	2,870	2,990	3,014	3,013	3,098	3,175
Minority	3,765	3,936	3,990	4,152	4,322	4,497	4,543	4,625	4,855	5,054
Graduate	8,814	9,241	9,488	9,470	9,384	9,430	9,445	9,247	9,103	9,190
Domestic	252	297	340	359	386	418	425	450	469	477
Hispanic (All Races)	225	233	232	231	240	225	222	221	219	217
African American (Only)	44	49	43	37	39	33	35	26	28	31
American Indian (Only)	1	2	5	4	4	4	4	4	5	9
Native Hawaiian (Only)	5,383	5,546	5,733	5,674	5,494	5,387	5,285	5,071	5,006	4,982
White (Only)	83	102	118	148	146	158	174	177	197	210
2 or More Races (Non-Hispanic)	453	417	383	322	280	265	266	276	229	225
Unknown	2,081	2,262	2,283	2,336	2,427	2,579	2,687	2,691	2,675	2,674
International	619	708	785	792	825	835	844	846	834	883
Summary	881	1,006	1,089	1,133	1,160	1,195	1,209	1,210	1,200	1,210
Minority										

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Figure M. Table showing student demographic breakdown by racial/ethnic breakdown, UW-Madison Data Digest, p. 6.

THE UNIVERSITY OF IOWA 2017-2018 Data Digest

Fall Semester Headcount Enrollment by Racial/Ethnic Category, continued

Student Level	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Postgraduate	1,398	1,343	1,308	1,272	1,370	1,318	1,417	1,306	1,323	1,308
Domestic	12	13	11	17	28	27	22	16	18	18
Hispanic/Latino	0	0	1	1	2	0	1	1	1	1
American Indian or Alaska Native	0	0	0	0	0	0	0	0	0	0
Asian	50	42	45	43	65	46	18	10	12	15
Black or African American	10	13	7	14	20	15	4	2	0	4
Native Hawaiian or Other Pacific Islander	0	0	0	0	1	0	0	0	0	0
Two or More Races	0	0	0	1	1	2	376	334	333	265
White	400	400	369	398	812	900	136	76	133	133
Not Specified/Unknown	110	113	688	654	337	434	665	667	613	679
International	348	342	298	344	304	294	296	293	271	293
All Students	30,501	30,281	30,777	31,145	31,420	30,996	31,332	32,093	33,288	33,964
Domestic	893	981	1,049	1,335	1,505	1,608	1,752	2,000	2,178	2,214
Hispanic/Latino	140	132	129	99	83	58	51	51	55	58
American Indian or Alaska Native	1,149	1,106	1,114	1,056	1,086	1,056	1,074	1,248	1,392	1,467
Asian	736	732	794	819	837	833	961	1,030	1,030	1,035
Black or African American	29	33	30	40	35	26	28	28	24	24
Native Hawaiian or Other Pacific Islander	0	143	243	334	400	628	1,008	1,054	1,160	1,190
Two or More Races	23,483	22,938	22,623	22,175	22,148	21,241	20,253	20,651	21,757	22,448
White	1,991	1,836	1,981	2,048	1,805	1,865	2,356	2,534	1,816	1,721
International	2,105	2,388	2,777	3,239	3,601	3,680	3,647	4,066	3,887	4,427

Source: MALIS/Registrar's data warehouse (see Note 1). See Note 4 regarding change in race/ethnicity reporting effective 2009.

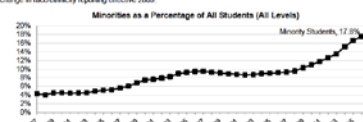
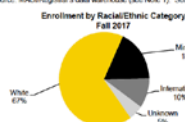


Figure N. Table and graphs showing student demographic breakdown by racial/ethnic breakdown, University of Iowa Data Digest, p. 11.

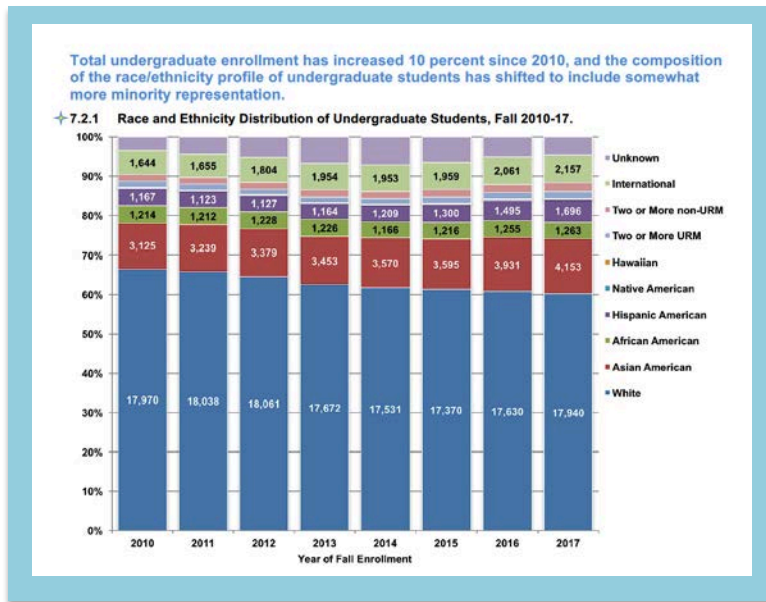


Figure O. Bar graphs showing student demographic breakdown by race/ethnicity, The Michigan Almanac, p. 97.

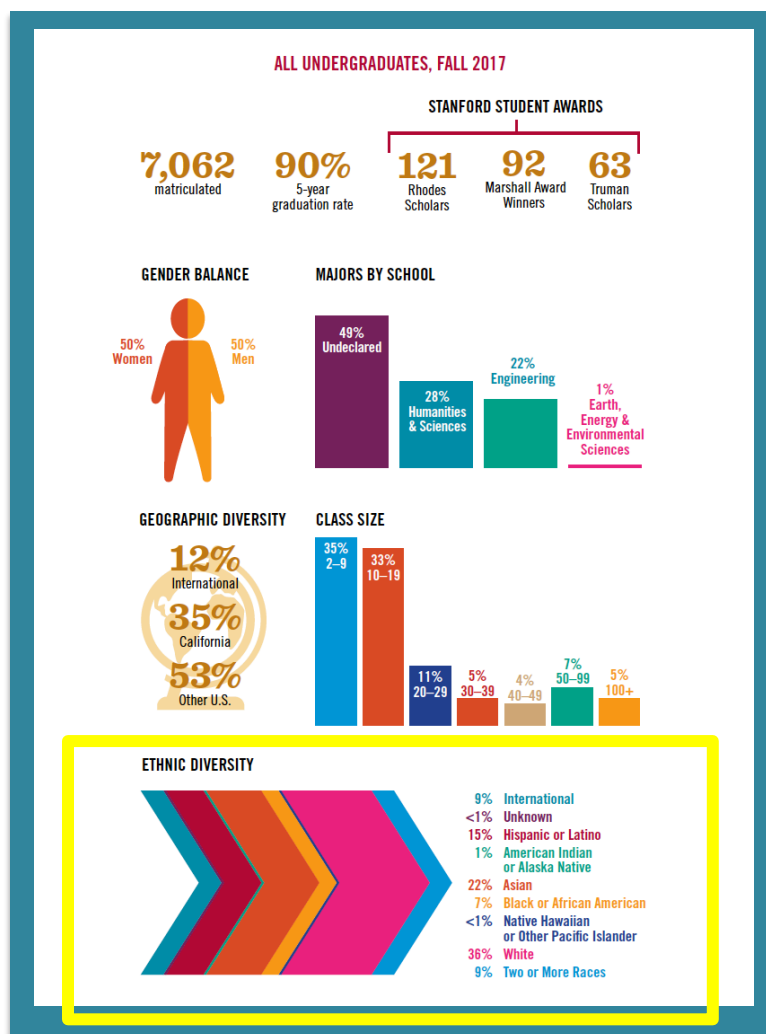


Figure P. Data graphics showing student demographics, including breakdown by race/ethnicity, Stanford Facts, p. 14.

When considering the four examples included here, Stanford best demonstrated how to take standard demographic statistics and make them more engaging for the audience. Their example (*Figure P*) includes attractive, bold colors — colors that at first glance don't match with Stanford's brand 'cardinal red', but are used consistently throughout the Stanford Facts booklet, so therefore become part of a cohesive look. The bar graphs used are very clean, without axes, merely using the colored bars that are clearly labeled with the corresponding data points. On the other end of the spectrum is UW-Madison's example (*Figure M*), which is one solid data table with very little visual appeal. It is a page full of numbers that blend together to the eye, which makes it more challenging to get context and perspective when comparing the numbers across the various columns. University of Iowa (*Figure N*) goes one small step beyond the data table and includes a pie chart, which does add an opportunity to get an understanding in the racial/ethnic breakdown of their student population at a glance. In the Michigan Almanac (*Figure O*), the University of Michigan uses bar graphs to show the demographic trend over the past eight years. This data visualization is fairly simple, looking like it came directly out of Microsoft Excel, as do almost all of the data graphics contained within the Michigan Almanac. While this example is not the most aesthetically pleasing, it does a solid job of clearly communicating its data in a way that the audience can see any demographic changes occurring from year to year, which puts it a step above the examples from UW-Madison and University of Iowa. Providing context and showing trends is one of the strengths of communication data visually.

Nonprofit Organizations

Teach for America

Included here are two examples that were produced by Teach for America in their 2017 Annual Report. Figure Q visualizes, using circles that are scaled to size, the number of Teach for America (TFA) corps members and alumni in 1990, 1995, 2000, 2012, and 2017.

The lighter teal circle expands greatly in 2017, showing just how large of an alumni network the organization has grown over time. Figure R goes on to show more detailed information about the 2017 class of TFA corps in almost an infographic format.

Figure Q. Scaled circle graphics, Teach For America, 2017 Annual Report, p. 5.

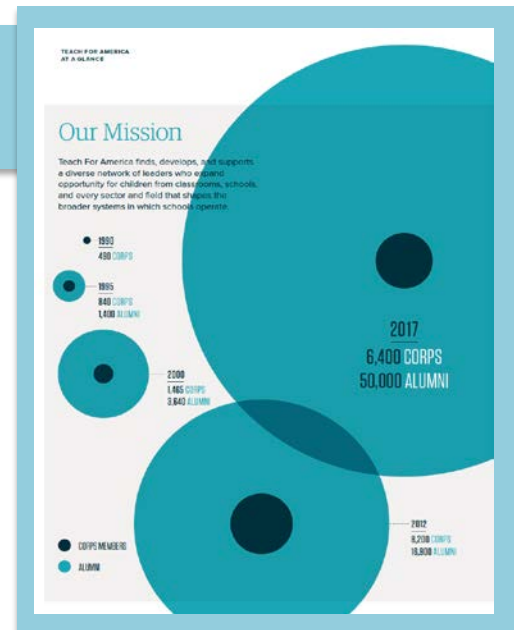
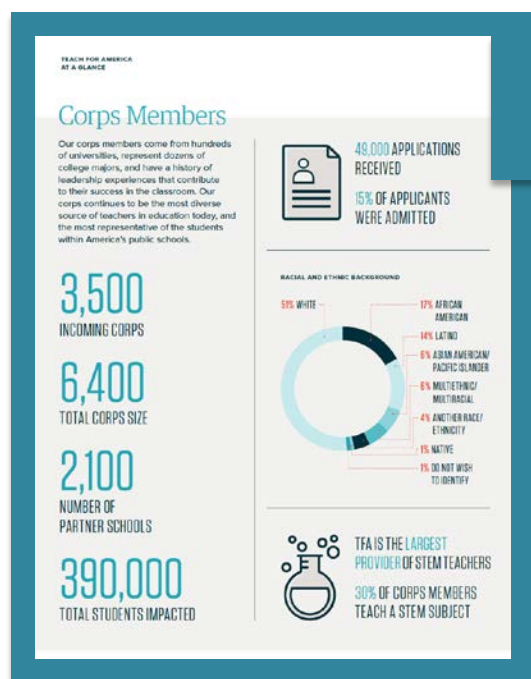


Figure R. Corps Member Statistics, Teach For America, 2017 Annual Report, p. 7.



It includes some enlarged numbers on the left hand side; on the right hand side there are two instances where summary data and statistics are included, paired with a graphic icon that matches the content, as well as one

data graphic in the form of a donut chart, which breaks down the racial and ethnic breakdown of the corps members.

These are both well-done examples of how a nonprofit organization can show organizational data in a visually appealing way. Figure Q, at first glance, is an attractive looking page, using the different shades of teal that are used throughout the report. Then, when looking more closely to what the page is communicating, the growing circles make quite an impression about the growth of the size of the Corps alumni network. Figure R matches the definition of an infographic, in that it mixes data visualization, graphic icons, and numerical data in sentence form, to tell a story. It takes information about the current class of Teach for America Corps members, and displays them the variety of ways mentioned, which makes the page interesting for the reader's eye to bounce around. The entire annual report, including the data visualizations that are within, have a very cohesive, coordinated look, which makes for a polished, professional, and appealing document.

Annual Reports – Financial Summary

A common place to find data displayed in the form of graphs or charts is within nonprofit annual reports. Included here are three examples from three different national nonprofit organizations, Planned Parenthood, Big Brothers Big Sisters, and the Sierra Club. This aligns with the insights that came out within the in-person interviews, which found that simple data graphics are a useful way of helping an audience understand finance and budget information that can be overwhelming to the average person.

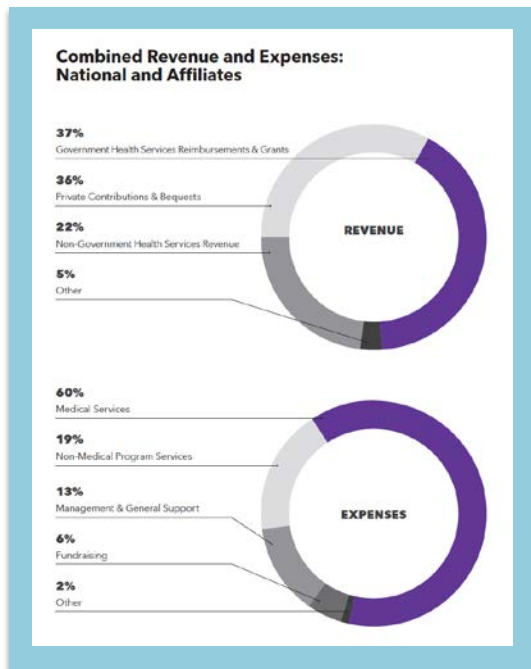


Figure S. Financial summary of combined revenue and expenses. Planned Parenthood 2016-2017 Annual Report, p. 33.

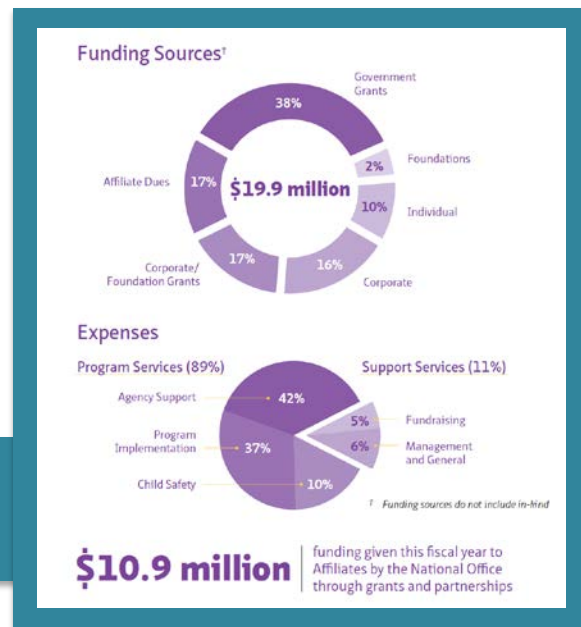


Figure T. Financial summary of funding sources and expenses. Big Brothers Big Sisters 2017 Financial Summary, p. 2.

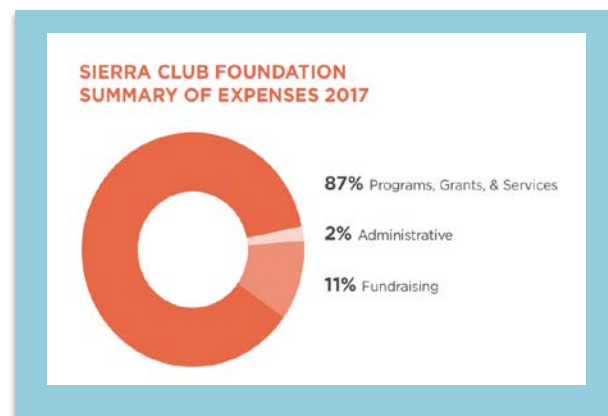


Figure U. Summary of Expenses. Sierra Club Foundation Annual Report, p. 21.

These examples show the donut chart as a popular way show a financial breakdown. The examples from Planned Parenthood (*Figure S*) and Big Brothers Big Sisters (*Figure T*) both use the brand's main color to visualize the data. The Sierra Club

example uses an orange, which is not the brand's main color of green, but is one of the main theme colors used within the Annual Report which is an attractive communications piece that complements the brand's signature green. Often times, budget and financial information is not the most interesting information that nonprofits and higher education institutions have to share. However, it is important information for those organizations, as it contributes to that trust and transparency that many of the interview participants mentioned as being so key to their organizations.

LIMITATIONS & FUTURE RESEARCH

One limitation of this study is the relatively small sample size of organizations interviewed. Higher education institutions in the Minneapolis-St. Paul metropolitan area were fairly well represented within the sample, however, only three non-profit organizations participated in the qualitative interviews. Conducting research across a larger sample of organizations would provide a broader base of insights on how organizations of varying sizes are using data graphics within their communications, as well as their perceived value of this type of communications. As we enter an increasingly visual culture, with software advancements in the field of data visualization, further research on this topic is needed to examine the measurable value for organizations. In addition to increasing the size of the research sample, there would be value in including organizational leadership outside of the communications function to the list of interviewees, to find if those leaders see value in their organization sharing data visually.

A recommendation for future research would be to conduct a content analysis of higher education institution and nonprofit communications. This analysis could examine how often data graphics are used across which types of communication channels, to see what the current status is for these specific fields. This research could also include if there are any accompanying metrics about the effectiveness of various communication types.

Additionally, a limitation of this study is that it did not examine the audiences' perception of data graphics as a part of organizational communications. There is great opportunity for future research to investigate the insights and impact of telling visual stories with data on various audiences. Learning more about if specific audiences view data graphics as persuasive and holding authority would be helpful in order for organizations to feel justified including them in their communications mix. This could include A/B testing using a survey or focus group to learn about how an audience member perceives communications pieces with and without data graphics.

This research begins to connect the growing field of data visualization occurring across a broader range of communication formats, to the insightful storytelling power of data for an organization to help further their communications goals. More research is needed to fully understand the issue; however the present research begins to uncover the role that data graphics can play for higher education and nonprofit institutions, and how communications professionals can become a key player in turning data into stories that move the needle for an organization.

STRATEGIC COMMUNICATIONS RECOMMENDATIONS

After reviewing related literature, conducting expert interviews with communications leaders, and conducting an informal content analysis, this research proposes the following strategic communications recommendations for higher education institutions and nonprofit organizations. These recommendations are designed to help organizations have the right organizational structure and knowledge in place for the communications team to produce data stories that will further strategic goals for the organization. While not all of these recommendations may be universally feasible to organizations, based on size and budget, this researcher believes that moving in this direction will benefit organizations of all shapes and sizes.

Recommendations

1. Organizations should strive to have the communications leadership in close partnership with other organizational leaders, to ensure strong alignment between overall strategic goals and the comprehensive communications strategy.
2. Organizations should invest in full time staff with a background in graphic design, who can focus on creating a variety of visual communications and brand materials for the organization. This includes someone with specific skills with the Adobe suite of products, such as InDesign and Illustrator. An important aspect of this should include an understanding of best practices in creating data and information graphics (see resources listed in recommendation #4).
3. Communications professionals should educate themselves on how to build effective data graphics, and how to integrate them into a meaningful

communications story. Though communications professionals across the field may not be the person directly creating the visual, it will help build a broader base across the profession of people who have an understanding of how impactful data stories can be for your organization. The following books are recommended as a place to begin gaining this knowledge.

- a. Cairo, A. (2016). *The Truthful Art: Data, Charts, and Maps for Communication*. United States of America. New Riders.
 - b. Knaflic, C.N. (2015). *Storytelling with Data: A Data Visualization Guide for Business Professionals*. Hoboken, N.J: John Wiley & Sons, Inc.
 - c. Wong, D.M. (2013). *The Wall Street Journal Guide to Information Graphics: The Dos and Don'ts of Presenting Data, Facts, and Figures*. New York, NY: W.W. Norton & Company.
 - d. In addition to the recommended reading, two additional resources are recommended:
 - i. Online MOOC Course, *Data Visualization for Storytelling and Discovery*, Knight Center for Journalism in the Americas at the University of Texas at Austin, taught by Alberto Cairo.
 - ii. Tableau Software Training, <https://www.tableau.com/learn/training>
4. As a number of interview participants mentioned, if a communications professional does not understand the positive impact that data graphics can play within their organization's communications, it will be impossible to advocate for their value to other leaders. Starting with the educational background mentioned in recommendation #4, communications professionals should use this knowledge

to conduct some communications research. To begin, review your communications plan to find topics that have accompanying data that could add value to the story. Work with the creative staff to develop data graphics that reflect your organization's graphic identity, and use best practices from *Storytelling with Data* (Knaflic, 2015). Next, produce two versions of the communication for that story — one that includes data graphics and one that does not. The communications team can then review communications analytics, such as social engagement, email click throughs, and web traffic, to compare the performance of the two different communication types. The organization could also conduct a short survey using the two versions communication piece that would allow their key audiences to provide feedback about whether or not the data graphics helped the message hit its target. Depending on what the results of this research shows, the communications team can use it to make the case to organizational leadership that investing financial resources (time and staff) into this form of communication is worthwhile to their organization. A greater understanding of what that data is saying will lead to smarter communication strategy, and more impactful communications.

5. Go beyond financial information. When reviewing communications from both higher education institutions and nonprofit organizations, it was fairly common to see data graphics as a way to communicate financial and budget information. Data graphics can have a much broader purpose, and as shown by the Spartan Success (Michigan State University, n.d.) webpage, they can be used to showcase key data points that tell a story for the organization.

SUMMARY

The first recommendation is much broader than the specific scope of this research, however it came through clearly from the interviews how important it is within an organization to have communications aligned with the larger organizational mission and strategic goals of the organization. The second and third recommendations stress the importance of having the right mix of expertise on the communications team; people who have deep knowledge of a subject — in this case analytics, strategy, and graphic design — that can create a strong, well-balanced team. The last recommendations are the most specific to the scope of this research. They are meant to empower individual communications professionals, as well as communication teams and organizations at large, to educate themselves on data graphics and visualization, which this research has identified as a growing trend and practice across the field. Communications professionals often play the role of translator, taking jargon-filled organizational language and adapting it for a larger audience. In a time where more information is being collected through data and analytics, communicators can help translate the data insights, and use them to tell key stories for the organization that advance communication and organizational goals. By following these recommendations, organizations can weave data stories into their communication strategy in a purposeful and impactful way.

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APPENDIX I: Interview Questions

1. Please introduce yourself, state your title within organization.
2. Can you tell me about some of the professional experiences you have had leading up to your current position?
3. Please describe the role you play in shaping the communication strategy within your organization.
4. What do you want to accomplish with your communication strategy?
5. What data or analytics do you gather and use to drive your communications strategy?
6. What do you think of data visualization? Would they be useful to your organization?
7. Do you use data graphics or data visuals in your communications?
 - a. What kinds of data? How do you use it? What software do you use?
8. Does your organization use visual data storytelling (or data graphics) in your various communication channels?
 - a. If yes, how? Where? Why?
 - b. If no, why not? What are the barriers to mixing it into your communications?
9. Do you think sharing data is important for your organization?
 - a. What data is important to your organization?
10. What data would you want to share with your audiences if there were no barriers to doing so? And, how?
11. What would it take for organizations to be doing this more, using data in a more visual way?

APPENDIX II: Interview Summary

These interview transcripts were recorded at the time of the interview, and have been edited for clarity and anonymity. They were not recorded, so at times responses might be verbatim, however many responses are abbreviated or condensed from the original statements.

1. Please introduce yourself, state your title within organization.

Identifying information is being withheld to preserve anonymity of the participants. Included in this response (question #1) are additional comments given by interview participants that may describe the role of their department within the larger organization.

Participant A

We concentrate on strategic priorities for the [organization], priorities from top leadership, that includes legislative priorities. We do [organization] wide projects, so if a department has a project or campaign they want to do, we wouldn't necessarily help them with that specific thing, they usually have their own communications team, but if it's a [organization] wide initiative that serves the whole [organization], we would help would that.

We connect a great deal with the communications directors for all the [branches of our organization], connecting with their work.

We have responsibility for all major channels, social channels that represent the organization.

Participant E

My role here is to manage a group of 4 (including myself). Internal & external communications is run through my team.

2. Can you tell me about some of the professional experiences you have had leading up to your current position?

Participant A

Have a masters in leadership, worked at a newspaper, in advertising. Then, went into the publishing industry, went to a small nonprofit after that, where I got to work on a magazine. Mainly had experiences in magazine, graphics, graphic design. Left there, went to [higher education organization] as director of marketing and communications. Was responsible for coordinating buying all ads, managed graphic design, photo/vid, writers, web, etc. Have worked in marketing comms for 15 years. Been at current organization for 4 years. Currently lead 10 staff, writers, designers, photo/video, we produce all of the content for our organization.

Participant B

Started as marketing associate here in 2001. I completed an MBA in marketing, then in 2011 became [new title].

Participant C

I've been with my current organization for 15 years, in current position for 3 years. Was previously in [central marketing office], which worked like an internal agency. There I got a lot of experience with audience segmentation. My current position leads communication for the Advancement Office within my organization.

Participant D

I was the Director of Marketing at [other organization], leading a range of marketing & communications. Had been in non-profits after agency life, and was doing some freelancing. When I worked in agency, most clients were healthcare and higher education. Example: we were trying to help communities understand the impact of diabetes. We were talking about different complex topics. We were doing healthcare campaigns with communities of color, dealing with cultural barriers. Health issues and cultural issues can be very challenging. The Somali community, we were talking to them about diabetes referencing foods they've never heard of before.

The concept of higher education, getting your bachelors degree, that is a much more complex thing than it seems. We have to open the door to folks, and too often in our field we use language that is not accessible, they are not going to engage. We have to help figure out, how do you translate your expert language to your audience.

Here is an exercise I like to do with people: Ask them, what do you mean by [XYZ example]. The audience, this doesn't mean anything to them. What language do you

need? I give them homework, to go talk to 5 people that don't know this topic - how many times to do you have to start over or correct your language? Even if they understand, if they don't care about it, it's still not the right language.

Participant E

Started with idea that I wanted to be a writer, somehow use writing as a career. I have a Bachelors in English. Started career doing some editing and proofreading. I then made the transition from catalog space to brand and design – brand development, design pieces, brand building. With that experience, I made the switch to non-profits. I am interested in figuring out how things come together to create a feel for a brand.

Participant F

I have an undergrad in mass communication, but I chose a different path. I was really interested in the PR side of communications. I worked in a number of positions that has built a strong breadth of experience. I have done graphic design, been a publications manager, supporting PR, brand, media, etc. I worked in a development office as the major programs manager.

Then I moved to an organization where I had my first really formulized communications role. At that organization, communications & marketing were separate. At my current organization, marketing and communications intersect.

Participant G

I have an undergraduate degree in exercise science & sports management, part of that included business & marketing. I had an internship doing marketing work, a lot of graphic design, video production, etc. In my next position, I did some crisis communications work.

From there, I became the Director of Marketing at [previous organization]. I got a masters in health & administration with an emphasis on communications. I came to this current position in 2016. I have about 10 years of communications experience within my field.

Participant H

I got my undergrad in broadcast journalism, did an internship at broadcast affiliate. I saw how long people worked to get there, how much they were paid, etc. and knew I couldn't do that long. I got a PR degree as well, and graduated in the middle of the recession, late 2000s, couldn't find a job in communications. A lot of people with experience were coming back to swoop up entry level jobs.

Took a chance and did a year with Americorps, kind of a risk, but exactly what I want to do, with lots of communications work. The work that organization was doing led me to my job here in MN. I moved here to take this job 3 years ago.

3. Please describe the role you play in shaping the communication strategy within your organization.

Participant A

We have the responsibility for setting the tone. This includes training and best practices. With the [communications directors] group, we discuss best practices & give guidance, how to communicate their strategic initiatives, identity and branding initiatives, communications campaigns for the [different branches of our organization].

Working on one for [department]. We are help them develop recommendations, positioning, look and feel. The plan is vetted, then turned back over to their staff to implement. We work kind of like an agency.

Participant B

I lead the marketing and communications team. I will listen to and kind of crowdsource among my team to make sure their expertise/experiences are distilled into something. We have to respond to what leadership in our organization wants. Those are the ingredients that are sometimes disparate. We have to sit in the middle of the see-saw of balancing those.

Participant C

We - I'm very fortunate, I have a full communications team. We shape 100% the messaging, for our audiences. We follow the goals, broader division goals, which of course lead up to [leadership] goals. In addition to that, within my organization there is a new department, called marketing insights and communications. They changed from the previous structure. It's led by a CMO, with 4 areas - PR, insights & analytics, creative, strategy. Strategy - within there are all the communication point people for each [branch of the organization]. This is a new practice, before, each [branch] was decentralized and responsible for their own messaging, now we are coordinated and there is support centrally.

Participant D

That is my role! It's really about setting the tone and the direction, understanding what our brand is, our core messages, our brand positioning, how does that come to life with

everything we do. When you [engage with our organization], when you connect with us, how does the brand come through.

Brand is about feeling, and you have to be able to create that feeling. It's so hard to describe what that is. I love target. Why do people love target? They don't always know exactly.

Hospitals work hard on what the waiting area, what their patient rooms feel like. Consider the BMW dealership waiting room vs Mazda waiting room. How do you create that experience for your brand?

Coca Cola - their core essence is happiness. They aren't shouting happiness, but you can see it displayed in everything they do. The little swoop that looks a little like a smile. It's so ingrained into the brand.

[Our field] is no different. You start to learn the personalities of the organizations.

You have this perception that people have about your organization. What is that, and what do we do with it?

It's an interesting fun thing, when you work in communications - figuring out what your persona is. Within an agency, a lot of that brand work comes out of many hours of research, interviews, focus groups, e.g. hearing this word or phrase keep coming up, what does that mean, etc.

At my last organization, we "refreshed the brand". I don't call it rebranding. We had evolved, we had to figure out what has changed. One of the exercises we spent a lot of time on was around the "why". Sitting with our communications specialists, looking at the info that we got from the research, coming back to - why why why why. It took us a couple months to get there.

Participant E

I work closely with the leadership, at the executive team level and at the programmatic level. I try to answer the questions of, how can we meet the objectives of the org as a whole, as well as the units and programs using communications and marketing.

I try to bring a lens, asking questions like – when we are developing programs and reaching audiences, what is the role that communications can play? What are we trying to accomplish? How can we communicate it in ways that enhance and support those

biggest goals? We try our best to use communications in support of the higher mission of the organization.

Participant F

I lead the development of that strategy, on behalf of the organization. I work with our leadership to ensure we're matching the organization's business goals with the messages that we develop, both the overarching messages and department level messages. I listen to a lot of conversations and input to develop a strategy. In a corporate setting, this process might involve more people, but it's just me.

My role by design is to be the strategist. Another position we have is marketing communications manager, which is more managing day-to-day operations of marketing department. Then, we have a digital marketing specialist.

Participant G

I am the role. It's - our communications - has evolved quite a bit in the last few months. During my first 2 years in the role, I tried to learn as much as I could without changing too much. Now I'm starting to take what I've learned and make some changes.

We're just now in the beginning stages of a strategic plan. We've done a lot of focus groups, surveys with participants. What we are looking for is probably more behavior based, we want to dig into the weeds of how are we personally affecting people and their personal development. We have found that [audience members] become more comfortable and confident through our programs here.

Next strategic phase will be to highlight those [participant] stories. We have found some [participant] stories that we think are applicable to a larger population. We're focusing on the idea of "you're welcome here" as a new brand of the department.

Participant H

I am the shaper. We're a small team, we're only 4 people; a [leader] and 3 [leadership team members]. We all play a role in the strategy, execution, and evaluation. I shape the communications strategy with a lot of executive direction from [leader]. We all work closely together, really focused on the mission. We do occasionally work with outside communications vendors. For example, every [month] to [month], we work with a PR firm in some capacity around our [big organization event]. They manage media relations, interview set up, crisis communications, etc. A little bit of creative stuff too - they help us think about key messages but mostly creative execution.

In the past, we might have worked every 2 or 3 years with a communications vendor, planning what we may do for communications for the next few years.

4. What do you want to accomplish with your communication strategy?

Participant A

Ultimately, our job is to make sure that we are honoring the brand and the mission of the organization. The brand comes out of the mission and vision. The mission is who you are. The vision is where you want to be. Brand is showing it in the day to day.

To have [main organization communications campaign] be shown throughout everything we do, not just in a tagline. As strategic initiatives change and ebb and flow, we need to keep up with the times. We are always looking at the medium, always audience identified right up front, and thinking about your goals with each audience. E.g., we talk to [audience 1] differently than [audience 2].

Participant B

To introduce the concept of [program model] to [main audience].

Participant C

We have 3 goals, the lens through which everything is filtered. *Goals withheld for anonymity.*

Participant D

This is my 7th month. I've been trying to really clarify our goals and unify our brand. Sometimes you understand but the rest of the world doesn't. But, it is really important to us.

The challenge we have is that when we created this new organizational structure, there wasn't a concerted effort in "what does that mean, and how do we talk about it". Ended up kind of fragmented; it fractured the brand. People feel that, it's one of the big challenges. We need to keep training the language up - start at [the larger organization] and then drill down. We want to shift the mindset - people think of us as a house of brands, not a branded house. We want to flip that.

Another challenge is teaching everyone what that means; in the work we do and how we do our work. It goes back to personality. It's easy to say this logo is off or the color is off, but communications and brand is bigger than that. How does it look to be 'on brand' when people walk on site at our organization.

We are re-establishing ourselves in the community. Great reputation, but it's focused on [one piece of our work and history]. It's more than that now.

Within last 2 years many of our competitors have refreshed their brand. We've grown and matured. It's been 10 years since we made [an organization transition], how do we tell people about how we've changed?

Participant E

We want to improve and increase [our organization's] visibility. To bring more people to a place where they understand what we do and that they feel connected to it. Making sure that people who are passionate about the thing we are, find out about us, know about us, and that we are finding the best way to bring them into the organization.

Another goal is ensuring that when people have a relationship with [our organization] that it is keeping with their expectations of the place. Very important that we are honoring relationships.

Participant F

Primarily, at the highest level, it's to play a key role in the organization meeting its goals.

Participant G

Our big goal, obviously, is that we want to provide information that is easily attainable. One main message we want to send is that wellness doesn't have a look, fitness doesn't have a look, it's all about your personal journey.

Participant H

In general, I want to communicate with [audience] and [audience], that would have anything to do with [our main product/service] with practices, ideas, execution, etc. In some cases, we're providing a campaign in a bottle. We work with the orgs from the beginning to the end. We work with [stakeholders] at all sizes of organizations. I like working with small and medium [organizations], they are the ones I think we can really move the needle with.

The rest of the year, we're talking about best practices for [our field]. We're talking about why they would want to use our website. We've found that our audience has a certain feeling about [our annual event]. We want to give them both thematic content that will help drum up that feeling, and content that will help them reach out to their networks to spread that feeling to others.

5. What data or analytics do you gather and use to drive your communications strategy?

Participant A

We have all kinds of different ways we collect data. There are surveys administered professionally, we survey opinion leaders every year about our communications. We conduct a public perception every year. One hard thing about it, it can ebb and flow with what's in the media more broadly. We can control what we do, we try to put the positive forward.

We have analytics for everything, metrics for everything. We look back and see what works and didn't work. We always consider best practices. Coming from a smaller organization, I think that we're really good at that.

Participant B

We have a couple main data sets that we look at. We have a lot of reporting that goes into [report], and then we may cherry pick data points out of that to assert, or empower, or prove, or mitigate doubts as promotion.

We work with Google Analytics, to see where our audience is spending their time on our website. Because we so often see a huge difference between self reported motivations/fears, and actual truth in decision making, in terms of our audience participating in our programs. Using the website tracking we can see that [audience] are looking for 4 minutes at the expensive program and not at the cheaper programs.

We look at social media posts, but we are mostly reacting to it. We find that ads on Instagram are really great for us. We are always pulling data from [database] for targeting and segmenting the marketing.

Participant C

I have 2 people on my team of 6 that work on analytics. We are tracking audience engagement scores, open rates, etc. [Audience] landing page has a homepage image rotator, it's not just fluff. We make sure each image leads to a story that matches with our 5 strategic priorities. On social, we match stories, gather social analytics.

We send out print, email, and have a web presence. For email, everyone has a personalized link, we measure that to see if it leads to giving. If someone gets the postcard, measure if they go to their personalized link. Then, we track hard online gifts.

Participant D

We're currently evaluating that. In a brand sense, it ranges from digital online analytics, website analytics, social media, which posts are getting shared, what's getting engagement, how are the traffic on all of those things, etc.

When we do advertising or marketing, if we have a tracking url, how does that look compared to the influx of inquiries from this time to this time?

Where are the patterns in our programming? Are there new competitors? Where are the shifts in the employment market? Where do we have some program restrictions, such as registration capacity? How do we make sure we are taking the right communication actions if we have 100 spots, not 300 spots. Not over doing it.

We have to look at things at the microlevel and the macro. How do we look at all those levels, to see the big picture but also see the details?

Participant E

Web analytics. Whatever we can pull in terms of program/service numbers, statistics, patterns. We have a pretty robust capability here, and it's baked into how we work. We have an organizational research arm, which engrains the evaluation into the work done across the organization. All of our programs & services we provide have a logic model, short term, long term, outputs, etc.

Participant F

We gather data from every dept, on programs, day to day operations – info on participants, what they participate in. The demographics behind our [program participants], and looking for where the gaps are in meeting our goals.

In [one area], we could collect more information that would help us draw conclusions for that part of our work.

For our finance department, we can work with them to help showcase the financial stability / financial path of the organization. We recently worked with them as the organization proposed a new investment, and we used a lot of graphics there.

We have demographic and geographic info of our participants, which we can use to focus and target our marketing across the metro area.

Participant G

It's pretty heavy on traditional data. Program participation numbers, trends.

Since I've been here, we're doing a survey on a 2 year cycle - a big awareness survey - how many [audience members] identify a need for our services, how many use our services, etc.

We redid our website about a year ago, so have better idea of where people are going on the page. For social media, we do a better job now, we didn't do a great job beforehand of tracking analytics.

Participant H

We gather more data than we can handle! We are a natural resource of data, cause we gather it as part of [our service line]. In the almost 10 years we've been around, we could pull a spreadsheet of over 1,000,000 lines of data.

One big barrier to even looking at and using the data we get? At this point, it comes in as one giant excel spreadsheet. This can be so overwhelming.

We look at google analytics data, how did people get to our site, which helps us tell the story. Mobile device usage on our website went from 3% to 35%. We look at social and email analytics. We get a ton of data, unlike many other organizations like ours.

6. What do you think of data visualization? Would something like this be useful to your organization?

Participant B

I don't think data alone can be persuasive. It has to be massaged, molded. I have sent staff to presentations, like, "presenting numbers to people who don't care". You have to take it the next step, make it an infographic, make it a different font, make it interesting.

Participant D

Yes, and we do it every day. Social media has grown. Culturally, the desire for data is growing. American culture loves a proof point. We see it everywhere, on social media, in annual reports. Part of the shift, also, is just being a much more visual culture. We see texting and emojis, we're going back to hieroglyphics. It makes sense, we live in a fast paced world. You can communicate more, and more quickly, with a visual than you can with language.

Think about a pie chart, you know that 75% is more than 25% but it becomes more clear when you see it displayed like that. For us, it shows up in both internal and external communications. In many budget communication pieces.

We are working to integrate [thing a] into [thing b]. We need to move 60,000 square feet in. People were sure that it couldn't be done. We made a data table. Big green box showing all of [thing b], little purple box of how that 60,000 of [thing a] fits into the whole picture. People reacted totally differently.

When you put it into a picture you get context.

The reason it's valuable, communication is about relationships. If you can't communicate clearly, you can't have a strong relationships. By using visuals as that avenue, you can create a better dialogue, you can have better communications and therefore better relationships.

Participant H

I think it could absolutely be useful, there is definitely potential. In a nutshell, we have such a small staff, we move around so quickly on mission critical things, that it tends to fall to the bottom of the list.

7. Do you use data graphics or data visuals in your communications?

a. What kinds of data? How do you use it? What software do you use?

Participant A

Yes we do. I think in general, people confuse infographics and graphics.

An example: [An important stakeholder] is confused about [our] budget. Even though it's all out there, it's transparent, it's just in a giant spreadsheet so it can be overwhelming.

We set out to build an easy to understand product, so we created a budget video. We used these simple graphs, and took a really visual, really simple approach. We wanted to offer the information in a simple way so anyone can understand it. Putting it in those terms made it somehow easier to understand. The stakeholder group needed to get it in a second. The visuals help us communicate in a really simple, clear, way.

Visuals help you take a complicated amount of stuff, and communicate it quickly in an easy way, to make it easier to understand.

We have financial data, which we need for funding conversations. With the budget situation I described earlier, our communications goal was getting the message across that, “look, we’re big, but it’s not complicated and we’re trying to be transparent”.

We’re using national statistical information about [audience] in an upcoming campaign. We might use data to try to break misconception about something, to drive home a communications goal.

The data we gather about our comms is mostly for us, internally. We use it to inform our tactics. If I need data, I’ll call up to the data people. We use it to inform our approach. Then, we use data to communicate.

Everything is super data driven. It’s not, “I think”. We work at a organization that values research, so we always have to back it up. We use it to back up our legitimacy in our approach to communications. That might be where we are different from smaller organizations. They often don’t have the staff or resources to watch the data. They might only be able to check on things once a year. We’re lucky that way.

Participant B

Yes, we do. It’s very audience specific. In all of our print collateral campaigns, we will take the same statistic and market it differently depending on the audience. We consider how we present that data. Boomer parents less excited about infographics. Gen X parents see it as a legitimate source of data. Our college age audience is receptive to them. [Audience] has a much higher tolerance for reading, they don’t mind reading embedded data points within text. I think as these people age out or as our audience gets younger, we won’t have to change as much how we present the same statistic.

Our team will create in Adobe Illustrator and Indesign for our communications pieces. Our organization has Tableau that they use for data work, but we don’t make any data dashboards for communications purposes.

Participant C

Yes we do, I brought a few examples.

We have a certain information set that we share each year, and we started presenting it graphically. We found it’s the best and most powerful way we can communicate that information. I personally hate looking at numbers, I’d rather look at a graphic. If the numbers tell a story let’s make it easier to look at.

We work with our central marketing team to create graphics. I believe they have the whole Adobe cloud of products. I know places within my organization use Tableau, though we don't. We do use Excel a lot, and a platform that tracks fundraising.

Participant D

Externally, we use them all the time on social media to highlight certain stats. We were working on a newsletter for [audience], we'll be showing stats in a really graphical way. Newsletters, social media, just the facts = bite sized, easily digestible.

Internally, we use it a lot for program evaluation and assessment. Our head of [data operations] is brilliant at summarizing things in a simple logical way. To say it clearly and precisely the first time is an art.

We have a new strategic plan, 6 strategic priorities. We're doing it with graphics so people can see them and share them easily.

Data can be qualitative or quantitative and tell a variety of different stories. For qualitative - what are the anecdotes that we're getting, quotes. How do we track them and use them?

Our organization's [data office] has databases, they use Excel, Google analytics. Social media software, meltwater, Facebook and other social has their own analytics. We conduct or look at market research surveys.

We are often using simple things like Word, Excel. The design team working in Adobe InDesign.

Participant E

Yes, we do. It depends on the area – that would be more robust for our organizational research arm – they would do a lot more charts, graphs, data viz, etc.

We don't use a lot of infographics – we don't have the capabilities to do that. We only have resources for a part time graphic designer, but their expertise is not creating infographics. Right now I think we'd rather tell a longer data story.

There is one project in our organization that is a data project, that is using data from census and displays it in real time. It's a more interactive project, you can choose your map, choose filters.

The way that we approach using data that would be in conjunction with a story, probably about a person, try to use the data – use a data point as a way to translate that personal story to a broader audience. More of a supplement rather than the product itself.

Tools we use: Adobe suite, we have video capabilities, motion graphics technology (but not people to use it). We have photography, camera, video equipment, etc.

Participant F

Interviewee provided a few examples.

The goals with [example 1] is to simply show our success; everyone wants to be involved with a successful program. For this other example, a one page summary sheet with graphs and graphics, the main audience is our core influencer group.

This example is a single slide that we created for and with our CEO for his various presentations. There are data visuals on the slide. This other slide was created for one particular donor, where we pulled out statistics and data that we knew was important to them.

Our annual report is our largest information piece that reaches the largest audience. Currently, we kind of separate the data from the stories, but for this next year, we will be integrating them more and embedding the relevant data alongside the matching story. We're trying to help connect the dots.

Right now we're working on a communication piece that includes some data graphs and and infographics. Today my team is making a presentation for our leader to share in an all-staff talk, that highlights stats showing where a particular work team did exceptionally well.

At our monthly all staff meetings we regularly share data.

The top audience we probably share data with would be our influencer group, people who are very numbers focused; actively involved business people who are spending their day using data to make decisions.

Participant G

Yes, almost exclusively. I believe that the “annual report” type document is an underutilized resource. We made a big change this year by moving it to an online platform. People are able to interact with it in a totally different way, able to dig into

different parts of the information. In that, we have infographics that tell a different data stories about our organization.

Technology has really transformed the way we tell our data stories. Our leadership uses our new online story (annual report) to talk to other [peer organizations]. We use parts of it in our funding request presentation. We used to bring handouts, now we show videos with graphics.

Participant H

We have not in the last two years. We will mention data points in a text narrative kind of way.

Last time we did it was with an infographic. Span of a few years where we made an infographic after every [big annual event]. It was made for print. We used to have it, spent a decent amount of time and money on it, it was made for a printed piece. We stopped doing it, besides posting on social, putting on emails, we didn't have a great distribution mechanism. Didn't seem right sized for the amount of work we're putting in. I worked with a designer when we were doing our last one in 2015.

In the present, in my head, I've had an idea - there are so many online build your own infographic tools, that I would consider doing it again in the future as a simple social share, but it keeps getting bumped down the list.

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- 8. Does your organization use visual data storytelling (or data graphics) in your various communication channels?**
- a. If yes, how? Where? Why?**
 - b. If no, why not? What are the barriers to mixing it into your communications?**

Participant A

Yes we do, 100%. Clarity in communication in a place like this is extremely valuable, the way that it can just cut through and make a point.

We share a lot of simple graphics that include data on our Twitter page. For example, we might have a different graphic to tweet at different legislators with statistics about our impact on their district.

Participant B

Yes, we do, I think a limited amount. We would include them mostly in print and on Facebook.

Question from Interviewer: Looking back at older communications pieces, do you think you are using data more visually today?

Yes, I do. I think infographics are becoming more universally perceived as legit, we used to present data in charts. Sometimes when people see \$\$ in a chart, they are like “ooo I’m not good at math”. But if you put it in a infographic, they can get it.

I think there has been the death of the data table, at least in our communications. I think as we transition more from print to web based that is one reason for why that’s happened.

In 2014-2015 we had the first version of our “by the numbers” page in our report. They were more of a crude tool, now they are more refined, more stylized. They have a more cohesive look.

Participant C

Most likely would be print, and social - we repurpose a lot of the print there. Our newsroom doesn’t use graphic representations of data as much, mostly feature stories.

Our barriers? Our capabilities of building it within our own department. If we don’t have access to our central marketing, we are limited in what we can produce. We need to produce more that we can have go through central, so we can’t always depend on them for everything.

Participant D

Not sure if there are barriers to creating it, but there are barriers when sharing it. Like telling any story, any story is open to interpretation. A lot of thought goes in to how we are going to visually represent something. We’ve all looked at a data piece, and you can tell it doesn’t make sense. It’s important to make sense of what is valid data and what’s not.

What is it that we are trying to achieve with this data? Are we trying to show the robustness of the data, or are we trying to engage someone in an interesting story with the data?

Then there is technicality of - should it be this color or that color, and the world of emojis.

What are you really trying to convey? When something is on it's own, it might tell one story. But if you put it together with other things, it might be something different.

Participant E

Not as much as we could be.

Our barriers: Resources at a high level - financial, cost for staffing.

Finding the capacity to budget it out, put money toward data visualization projects. That piece has never come to the forefront. Currently, we make sure we get newsletters, annual reports, social media out.

I think too, we're - at an organizational level - lacking an understanding of what role data stories/visual data could play. We understand that data is important, that stories are important, but not how to bring them together. We like our work, but I don't think we have a lot of experience in where the data visualization field is going. I think it's important but I don't know how to do it more.

There is also maybe a lack of awareness of - of not knowing or not being able to express the business case for investing in this type of communications.

Participant F

One challenge that we come up against is – how much of our data do we share? Are we sharing proprietary information that could be used by our competitors? Also, finding the right amount so people don't become overloaded with data.

I don't see too many barriers - these days there are all sorts of tools to help create graphics and visuals. The data is in abundance. It's more about just getting to it and tweaking our internal processes to it more of a priority to bring data into our stories.

Participant G

We currently are using it more in more formal channels, like the ones I mentioned above. Also, blog stories can be a great way to tell stories that include data points.

On social, we're trying to change our brand on social a little bit, be a little more emotional. Rarely do we share data and statistics. Maybe if we won an award, that did get tweeted out.

Participant H

Not for the past 2 years.

9. Do you think sharing data is important for your organization?

a. What data is important to your organization?

Participant B

Definitely. Some of it is just being a public [organization]. With our [organizational status], there is an importance in being honest, transparent, when serving the public and being a financial steward.

The most important audience is [organizational leadership]. They want us to bring the data. Don't bring a nice story, a feel good story. [Other audience] wants that. For [outside audience], it shows that we're legit, we're measuring things, we're part of our larger organization, which gives them trust.

Most important will end up being past program participation to glean consumer insights, and then use them to inform forecasting and program development.

Participant C

I do, and I think it's gonna be even more so. The message can get through clearer. I think it could be overlooked if we didn't use the graphics to help make it interesting.

Participant E

I do. I think it would help us tell the story we're trying to tell. Relationship building is about authentic stories. If we had that capacity we could work toward that goal. It would help us tell stories about complex ideas, I could see it playing a role there.

I could see it helping with the challenges we face with anonymity. For legal and ethical reasons we are protective of the people we serve. The data stories might help us talk about the big idea, tell the story, without pinpointing a person or calling them out specifically.

In regards to annual reports, I think things are changing. You don't have to wait till the end of the year to understand an organization's impact or financial standing. More and more people that are contributing expect that information in more of a on-demand nature. An organization can't rely on the annual report to justify why we are worthy of support or attention, so we have to think about other ways to make that known all throughout the year. People respond to different forms of information. Annual reports can no longer be seen as THE THING that makes your case.

Participant F

Yes, absolutely. We need to show that we are making an impact on the community where we are doing business, and showing process towards our ultimate mission as well as our business objectives.

Participant H

I think so. There is nowhere else that has the sort of data about [our sector] in MN on a broad scale as what we have. In one way, it's up to us as the champion for [our cause] in MN. We could maybe do more to analyze data about [our sector] for other organizations like ours.

10. What data would you want to share with your audiences if there were no barriers to doing so? And, how?

Participant A

I've spoken about how I feel like, overall, we are fortunate with our resources. We have strategists on staff, many communications offices don't have that. We do a report at the end of something, e.g, here's how this video did, or this initiative did, and I would say that is rare in [our field].

In general in [our field], something that's needed is having strategists that can look at the data frequently. It helps you be strategic, helps you stay strategic. This means more than once a year for the annual report, and more than when someone is reacting to a problem.

At a previous job, we didn't even have a central data office like we do here.

Question from Interviewer: what are the barriers?

We rely on the data office to pull a lot for us. We have to keep up [organizational] facts and figures, and we're responsible for making sure those things are correct. We end up relying on the same 2 people for a lot.

Participant B

I don't think we would change anything about which data we share, but we currently have a volunteer who loves looking at Google Analytics. If we had all the money in the world I would hire someone like that full time. It would be more about looking on the backend at the insights. The most important audience is [audience], and there is so much resistance to data/numbers, I think we're including enough that they will

see/absorb/process it, that it's not causing them to run away. The way Gen Z is going, less words, numbers, images are important/key.

Participant C

I don't know. I think when we have a story to tell, and data to back it up - we're going to find a way to tell it. We will make that one of our priorities and work with central marketing to get it produced.

Participant D

There are some that we are limited in because they are so complex. There was a story recently in the Star Tribune, about our field. We could do some cool communications stuff around that story, but it needs more context and explanation. Even if we can put it clearly, are people really going to believe it or understand it?

There are some stories that we know we can do really well, but it comes down to the interpretation, and what the user does with it. If it's not helpful it's not worth sharing .

How can you share important but sensitive messages? It's really easy to create the negative outcome. What are you trying to say, and does it get skewed?

Participant F

I think we have all the data we need, I think we're sharing it – but it's important to make sure we're sharing it appropriately.

What's important is that you have to build the story around it. Data often cannot stand alone, it has a story, it has to have a context. We're trying to do this with the changes to our annual report. We work in the data every day, but our audiences likely do not, so we have to take the time to explain it.

Participant G

Yes it's important. The key audience for us is the higher ups. When we need funding, it's vital to have numbers available and accurate, and to communicate them clearly. Any time we request [various types of funds], the data controls those conversations.

Interviewer asks, "Do you have barriers to communicating this way?"

We're pretty limited in how we can communicate with [particular audience]. We have partners, we can ask them help us get messages out. We use the standard platforms that are in existence to communicate with [audience].

We get some pushback from [particular stakeholder group], which doesn't always value our data or they question how we get our data, which can be frustrating.

Participant H

I think that, in a communications angle, the information we get from a particular survey. After every [audience] participates in [an action] they get a survey, asking "why did you [take this action]? We get it, we collect it, but we're not doing really anything with it.

There is so much possibility, I don't even know where I would start. What I would want to have is expertise / capacity. I don't have the expertise, but with the capacity, I think I could do it. To dive in the data, to know what you're looking for. To think about that in terms of what communications opportunities are out there.

It could go to across more than just [our two main audiences], it would be helpful to specific projects we had. We switched a procedure a few years ago, which allowed one audience to take a new action that was beneficial to another audience. The data that came from that change told a really powerful story, which also gave us strong information to use when comparing with competitors.

We did recently hire a really good data firm to look at a particular audience pattern, and found out something really insightful that we were not aware of before. In sharing that message with specific audiences, they were able to see themselves being a good community player.

11. What would it take for organizations to be doing this more, using data in a more visual way?

Participant A

I would say: resources for getting the data and getting the data right. You need to have someone to visually communicate it well. You need a graphic designer with visual sophistication to understand how to do it in an effective way. Powerpoint, no thanks. We receive many high level presentations and communications from leadership. They realize it needs cleaning up, polish, sophistication, etc. They see that it matters.

Participant B

To have multiple hours of graphic design talent set aside to create unique infographics for each data point. My answer might be different if we did an annual report. I think the AR is becoming a more dated resource.

Participant C

When I go to a conference, I feel like I see more people talk about their examples of data graphics and visualization. Infographics are more of the norm, and not the exception. But still, at the core, it's storytelling.

Before we might not have gone into the numbers within a story, but now it seems more credible to include them, highlight them.

Participant D

I think organizations love showing data, love showing a proof point, showing their outcomes. I don't think it's a matter of how do show it more.

It's more a matter of how do you collect the data, how do you collect valuable data (which can be subjective)? The challenge is more, we have this story to tell, what are the data to back it up. How do you collect reflective, accurate data.

I think everyone should have to take basic stats class. It's really easy to take one of the data points and tout it, but there is a lot of work into getting precise numbers and it can be easily manipulated.

Participant E

I think it would take a greater commitment of organizations to understand communications as an integral part of that mission. Some places do it really well – they are the ones that show up in case studies, like Charity Water. Sometimes, organizations are so focused on the mission as a service – as something you can hold in your hand and point to - that some people see communications is something that comes in later.

Also, finding out what we can even measure that shows in impact for our work.

Participant F

The key to do it well is have someone to interpret the data and then take that to a truly informational graphic – not just a chart. This requires professional designer and someone with a knowledge in strategic communications – someone that can take it from one point, very baseline, and take it to the next level to help your audience make a decision or act on the information.

Participant G

You have to have some kind of advocate system where people are going to be transparent with their data. Some [branches of our larger organization] might not want to present their data.

Also, there has to be resources where you can easily share your data - whatever that looks like. In this world of technology there has to be easier ways to share our data

When you are asking others/partners to share your data / information, is the information going to be presented in the right way, in the way that you want it, the way that matches your brand? This can be some cause for concern.

Participant H

I think of small to medium organizations - and at the very base level, the time, the money, the resources. There is also the expertise needed on how to analyze data, and how to do think about data in terms of what story you're trying to tell.

The visual piece is really important - we don't have any visual on staff.

Many organizations like ours are limited in that they don't collect a lot of data.

Having and taking the time to reflect and think about - you can use whatever data you have that can be a person/human focused, be able to have data through outside data sources, or your own org, how can you can make that fit into your story. It will be a lot more powerful if it's told in a visual way.

Just the time to think about - wow, I could use data more, and I could use data in a visual way. I don't think a lot of people think about that, especially when they are just trying to meet the demands of our organization every day.

Thinking about using the data that you may just be using internally, what is the story behind that and how can you tell it.

APPENDIX III: Figures Included


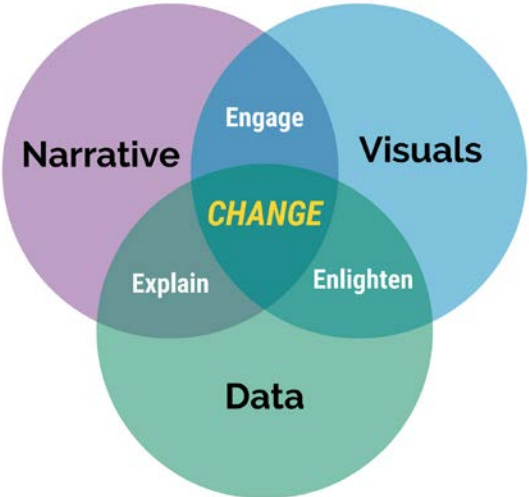
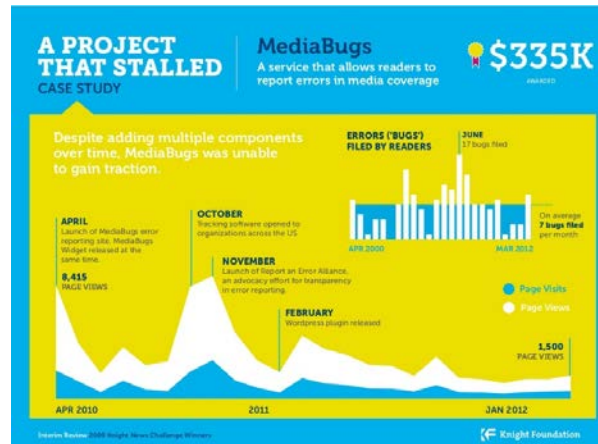
FIGURE	IMAGE
<p>Figure A</p> <p>World Bank Group. (2018). <i>Atlas of Sustainable Development Goals</i>, cover page. Retrieved from http://blogs.worldbank.org/open-data/2018-atlas-sustainable-development-goals-all-new-visual-guide-data-and-development</p>	
<p>Figure B</p> <p>Fyfe, L. (2018). Adaption of diagram from:</p> <p>Dykes, B. (2016). <i>Data Storytelling: The Essential Data Science Skill Everyone Needs</i>. Forbes. Retrieved from https://www.forbes.com/sites/brentdykes/2016/03/31/data-storytelling-the-essential-data-science-skill-everyone-needs/</p>	

Figure C

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**Figure D**

Knight Foundation. (2012). *Infographic: How Ideas Can Stall*. Retrieved from <https://www.knightfoundation.org/newschallenge-how-ideas-can-stall/>

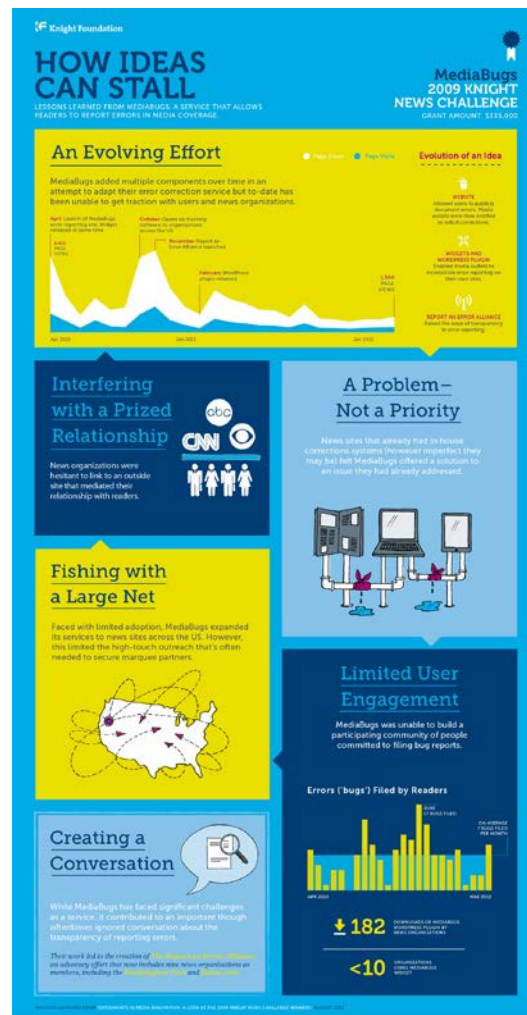
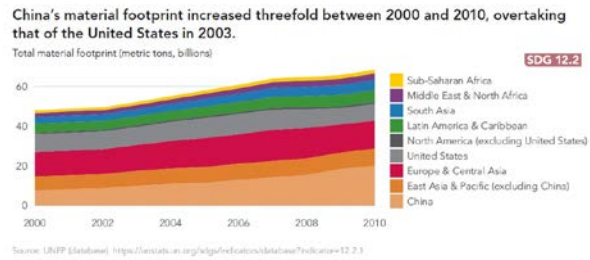


Figure E

World Bank Group. (2018). *Atlas of Sustainable Development Goals, China's material footprint increased threefold between 2000 and 2010, overtaking that of the United States in 2003*, p. 46. Retrieved from <http://blogs.worldbank.org/open-data/2018-atlas-sustainable-development-goals-all-new-visual-guide-data-and-development>

**Figure F**

Charity Water (2017). *2016 Annual Report, The Water Crisis*, graphic, p. 3. Retrieved from <https://www.charitywater.org/about/financials>

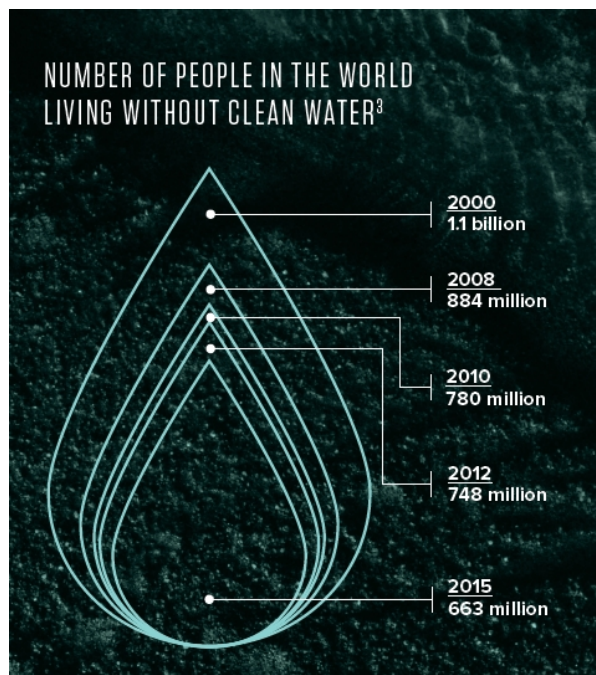
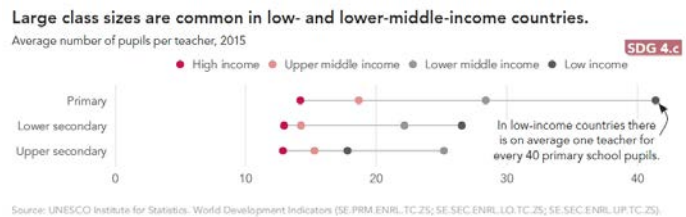


Figure G

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**Figure H**

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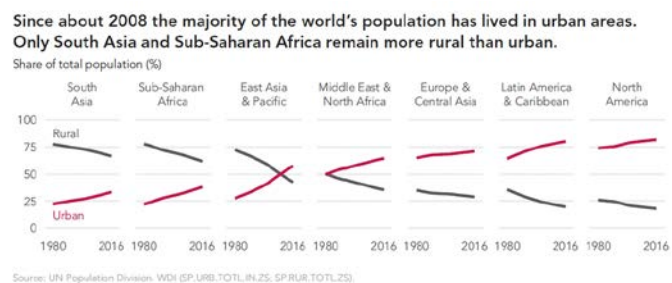


Figure I

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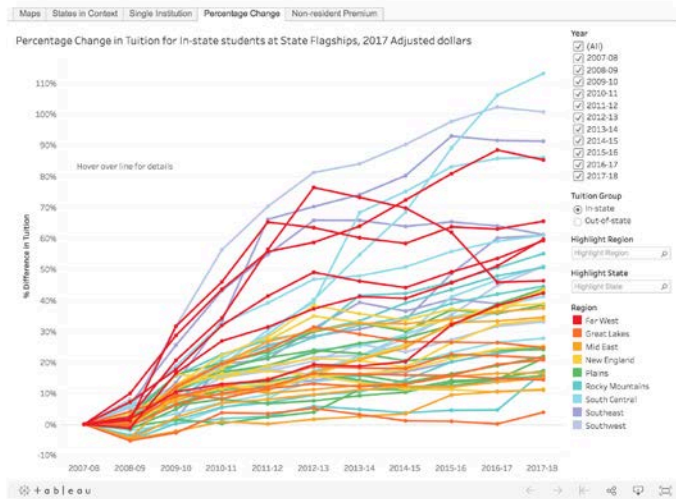


Figure J

Michigan State University (2018). *Spartan Success: Job Placement Rates*.

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Figure K

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Figure L

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Competitive Salaries.

Retreived from

<https://spartansuccess.msu.edu>

COMPETITIVE SALARIES

From Fortune 500s to startups — Spartan
grads compete in the marketplace.

**Figure M**

University of Wisconsin –
Madison (2018). *Fall Semester
Headcount Enrollment by
Racial/Ethnic Category (Federal
Methodology)*. 2017-2018 Data
Digest, p. 6.

Retreived from

<https://apir.wisc.edu/data-digest/>

University of Wisconsin–Madison

2017–2018 Data Digest | Students | 6

Fall Semester Headcount Enrollment by Racial/Ethnic Category (Federal Methodology)

Student Level	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Undergraduate	29,153	28,690	28,897	28,737	29,118	29,504	29,302	29,580	29,536	29,931
Domestic	1,048	1,103	1,131	1,247	1,288	1,354	1,403	1,406	1,465	1,559
Hispanic (All Races)	765	762	685	644	611	633	620	616	628	631
African American (Only)	147	128	109	79	67	65	65	62	52	59
Asian (Only)	1,574	1,575	1,566	1,540	1,500	1,626	1,609	1,635	1,710	1,703
Native Hawaiian (Only)	15	22	25	30	39	36	37	38	32	31
White (Only)	23,152	22,519	22,631	22,468	22,595	22,757	22,578	22,541	22,140	21,903
2 or More Races (Non-Hispanic)	224	347	466	603	719	777	809	873	968	962
Unknown	893	801	611	412	225	118	88	80	81	239
International	1,335	1,433	1,673	1,714	1,964	2,138	2,093	2,329	2,460	2,734
Summary	2,616	2,750	2,731	2,834	2,870	2,990	3,014	3,013	3,098	3,175
Minority	3,785	3,936	3,990	4,152	4,322	4,497	4,543	4,625	4,855	5,054
Graduate	8,814	9,241	9,488	9,470	9,384	9,430	9,445	9,247	9,193	9,190
Domestic	252	297	340	359	386	418	425	450	469	477
Hispanic (All Races)	225	233	232	231	240	225	222	221	219	217
African American (Only)	44	49	43	37	39	33	35	26	28	31
Asian (Only)	292	333	351	359	368	361	347	331	335	365
Native Hawaiian (Only)	1	2	5	4	4	4	4	5	9	9
White (Only)	5,383	5,546	5,733	5,674	5,494	5,387	5,285	5,071	5,036	4,882
2 or More Races (Non-Hispanic)	83	102	118	148	146	158	174	177	197	210
Unknown	453	417	383	322	280	265	266	276	229	225
International	2,091	2,262	2,283	2,336	2,427	2,579	2,687	2,691	2,675	2,674
Summary	619	708	765	792	824	836	844	848	871	901
Minority	881	1,006	1,089	1,133	1,181	1,199	1,206	1,208	1,250	1,308

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Figure N

University of Iowa (2018). *Fall
Semester Headcount
Enrollment by Racial/Ethnic
Category, continued*. 2017-
2018 Data Digest, p. 11.

Retreived from

<https://provost.uiowa.edu/data-digest>

THE UNIVERSITY OF IOWA

2017-2018 Data Digest

Fall Semester Headcount Enrollment by Racial/Ethnic Category, continued

Student Level	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Postgraduate	1,389	1,343	1,308	1,372	1,379	1,318	1,417	1,306	1,323	1,369
Domestic	17	13	11	17	28	27	22	10	18	19
Hispanic/Latino	0	0	1	1	2	0	1	1	1	1
American Indian or Alaska Native	50	42	46	43	15	46	18	10	12	15
Asian	10	13	7	14	20	15	4	2	0	4
Black or African American	0	0	0	0	1	0	0	0	0	0
Native Hawaiian or Other Pacific Islander	0	0	0	0	1	2	390	334	333	265
Two or More Races	406	439	369	386	512	500	136	93	76	133
White	516	513	566	554	337	434	565	567	513	679
Not Specified/Unknown	345	342	298	341	304	294	296	283	271	283
International	345	342	298	341	304	294	296	283	271	283
All Students	30,801	30,288	30,777	31,145	31,429	30,996	31,322	32,893	33,388	33,564
Domestic	863	981	1,066	1,336	1,326	1,406	1,712	2,880	2,178	2,214
Hispanic/Latino	145	132	120	99	83	60	51	51	66	58
American Indian or Alaska Native	1,343	1,100	1,114	1,056	1,068	1,050	1,074	1,249	1,362	1,457
Asian	796	732	704	619	637	633	657	661	1,090	1,055
Black or African American	29	33	36	40	35	26	26	20	28	24
Native Hawaiian or Other Pacific Islander	0	143	243	334	420	628	1,006	1,064	1,185	1,100
Two or More Races	22,483	22,238	22,623	22,175	22,118	21,241	20,229	20,651	21,757	22,448
White	1,961	1,936	1,961	2,046	1,955	1,965	2,358	2,084	1,916	1,721
Not Specified/Unknown	2,133	2,388	2,777	3,239	3,501	3,680	3,447	4,060	3,867	3,407

Source: MAUI Registrar's data warehouse (see Note 1). See Note 4 regarding change in race/ethnicity reporting effective 2009.



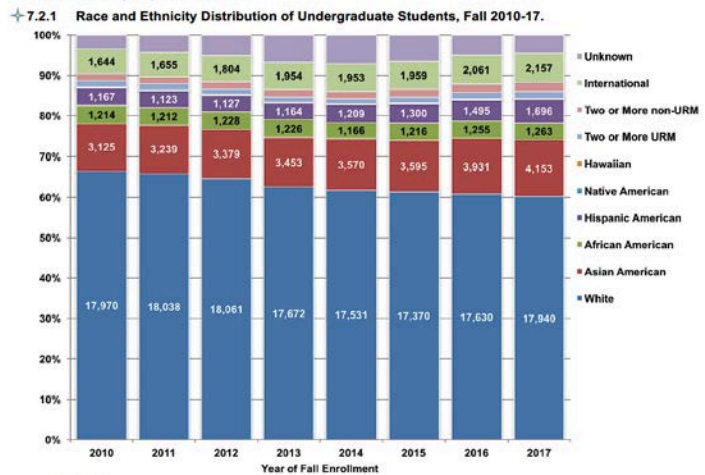
Information and Resource Management, Office of the Provost 11

Figure O

University of Michigan (2018). *Race and Ethnicity Distribution of Undergraduate Students, Fall 2010-2017*. Michigan Almanac, p. 97.

Retrieved from
<http://obp.umich.edu/michigan-almanac/>

Total undergraduate enrollment has increased 10 percent since 2010, and the composition of the race/ethnicity profile of undergraduate students has shifted to include somewhat more minority representation.



SOURCE: U-M Student Data Sets.

Data for students who identify as Hawaiian, Two or More Under-Represented Minority (URM), or Two or More non-URM are only available for 2010 and later, following a change in federal requirements for collecting race and ethnicity data from students.

"Two or More URM" represents non-Hispanic students who identified two or more ethnicities and at least one of the ethnicities included African American, Hawaiian, or Native American.

Figure P

Stanford University (2018). *All Undergraduate demographics*. Stanford Facts, p. 14

Retrieved from
http://facts.stanford.edu/pdf/StanfordFacts_2018.pdf

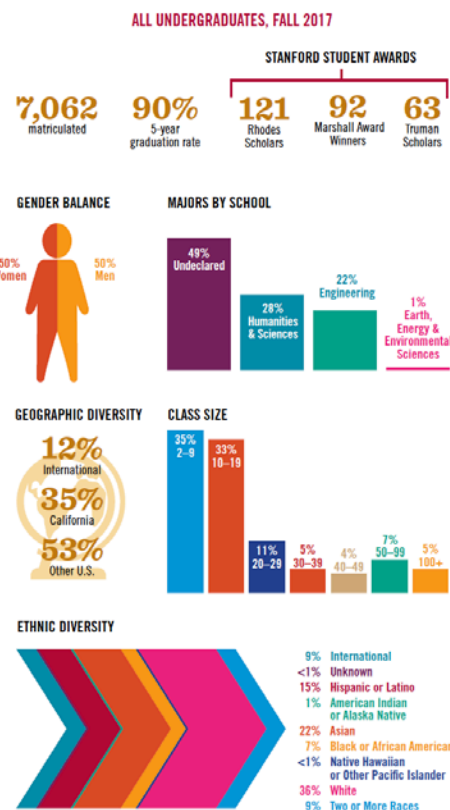


Figure Q

Teach For America (2018). *Our Mission, scaled circles*. 2017 Teach for America Annual Report, p. 5.

Retrieved from

<https://www.teachforamerica.org/about-us/our-work/annual-reports>

**Figure R**

Teach For America (2018). *Corps Members*. 2017 Teach for America Annual Report, p. 7.

Retrieved from

<https://www.teachforamerica.org/about-us/our-work/annual-reports>

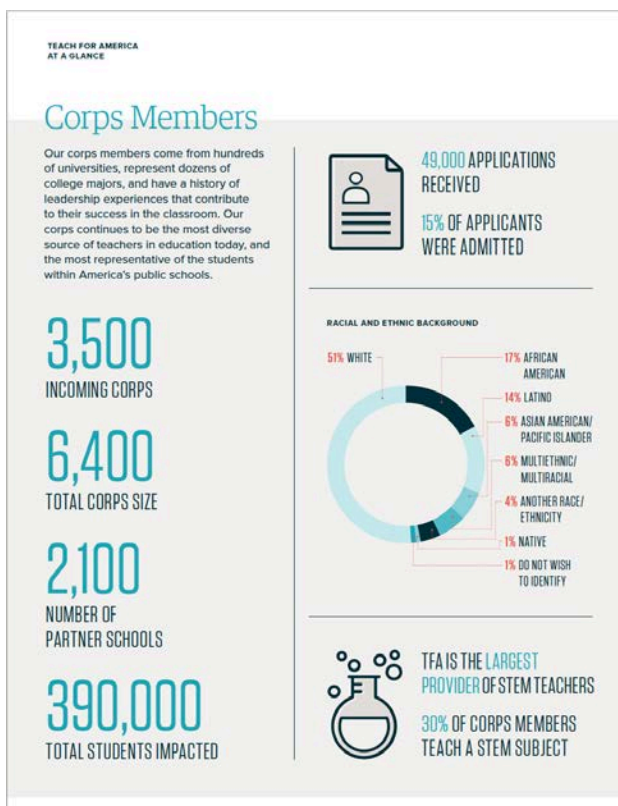
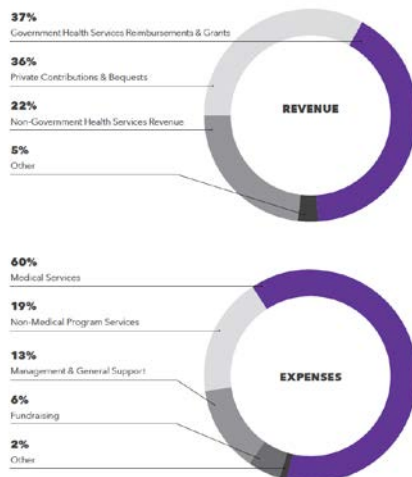


Figure S

Planned Parenthood (2017). *Combined Revenue and Expenses: National and Affiliates*. 2016-2017 Annual Report, p. 33.

Retrieved from

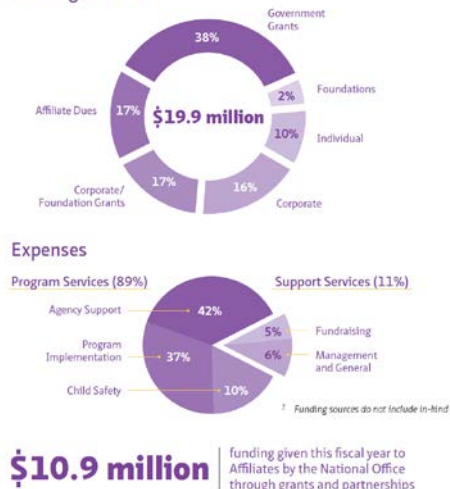
<https://www.plannedparenthood.org/about-us/facts-figures/annual-report>

**Combined Revenue and Expenses:
National and Affiliates**
**Figure T**

Big Brothers Big Sisters (2018). *Funding Sources & Expenses*. BBBS 2017 Financial Summary, p. 3.

Retrieved from

<http://ar2017.bbbs.org/>

Funding Sources¹
**Figure U**

Sierra Club (2018). *Sierra Club Foundation Summary of Expenses*. 2017 Annual Report, p. 21.

Retrieved from

https://www.sierraclubfoundation.org/sites/sierraclubfoundation.org/files/2017_annualreport.pdf

**SIERRA CLUB FOUNDATION
SUMMARY OF EXPENSES 2017**
